

UNITED STATES OF AMERICA:
WAR DEPARTMENT.

MONTHLY WEATHER REVIEW.

(GENERAL WEATHER SERVICE OF THE UNITED STATES.)

JUNE, 1890.

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INTRODUCTION.

This REVIEW is based on reports for June, 1890, from 2,365 regular and voluntary observers. These reports are classified as follows: 171 reports from Signal Service stations; 127 reports from United States Army post surgeons; 15 reports of rainfall observations of the United States Geological Survey in Arizona and New Mexico; 1,464 monthly reports from state weather service and voluntary observers; 24 reports from Canadian stations; 175 reports through the Central Pacific Railway Company; 389 marine reports through the co-operation of the Hydrographic Office, Navy Department; marine reports

through the "New York Herald Weather Service;" monthly weather reports from the local weather services of Alabama, Arkansas, Colorado, Illinois, Indiana, The Iowa Weather and Crop Service, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Missouri, Meteorological Report of the Missouri State Board of Agriculture, Nebraska, Nevada, New England, New Jersey, New York, North Carolina, North and South Dakota, Ohio, Oregon, Pennsylvania, South Carolina, Tennessee, and Texas, and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

CHARACTERISTICS OF THE WEATHER FOR JUNE, 1890.

The month was cooler than the average June in New England, the Saint Lawrence Valley, and the Canadian Maritime Provinces, and from the eastern slope of the Rocky Mountains and the west Gulf states westward, save at stations on the immediate Pacific coast between San Francisco, Cal., and the mouth of the Columbia River. Over a greater portion of the country lying east of the Rocky Mountains the month was warmer than usual. At stations in the south Atlantic states, Arkansas, Kansas, the Ohio Valley and Tennessee, the Lake region, the upper Mississippi and Red River of the North valleys the mean temperature was the highest, and at stations in the northern plateau region and on the north Pacific coast the mean temperature was the lowest reported for June during the respective periods of observation. The highest temperature reported was 120°, at Collyer, Kans., on the 21st, and the lowest temperature reported was 12°, at Breckenridge, Colo., on the 6th. At stations in North Carolina, Georgia, central Texas, Indiana, Michigan, Wisconsin, Minnesota, Iowa, Illinois, Missouri, Nebraska, Kansas, and southern California the maximum temperature was as high or higher, and at stations in the lower Rio Grande valley, central Colorado, extreme north-western Washington, and in the Sacramento Valley, California, the minimum temperature was as low or lower than previously reported for June. Frost injurious to vegetation was reported in southeastern Idaho on the 3d, 12th, and 13th; in central Utah on the 4th; in eastern Colorado from the 4th to 9th; in northern New York, several sections of Michigan, and east-central Arizona on the 8th; in southeastern Wyoming on the 14th; and in west-central Wyoming on the 16th.

The heaviest precipitation was reported in northeastern Iowa, where it exceeded sixteen inches, and the monthly precipitation exceeded ten inches on the west-central coast of Florida, in northern Illinois, south-central Indiana, northern and western Iowa, southern and central Louisiana, in adjoining parts of North Dakota and South Dakota, and in north-eastern Wisconsin. Over a greater part of the southern half of California and thence eastward over the Colorado and lower Gila valleys no precipitation was reported. The greatest

excesses in precipitation occurred in the extreme northwest, where nearly double the usual amount fell, and on the north Pacific coast and in the west Gulf states, where the monthly precipitation was about one-fourth greater than the average amount for June. On the south and middle Pacific coasts, on the southeastern slope of the Rocky Mountains, and over the middle and southern plateau regions less than one-fourth, and in the south Atlantic states and on the middle-eastern slope of the Rocky Mountains less than one-half the usual amount of precipitation for June fell. At stations in Kentucky, Indiana, Iowa, Wisconsin, South Dakota, North Dakota, and Washington the precipitation was the heaviest, and at stations in North Carolina, South Carolina, Georgia, Florida, Arkansas, Tennessee, Illinois, Colorado, Kansas, central Texas, Arizona, middle and southern California it was the least ever reported for June. Measurable snowfall was reported only in central Colorado and east-central and north-central Nevada, the greatest depth, 4.8 inches, being noted at La Veta, Colo., and trace of snowfall was reported in northern New Hampshire and southern Wyoming.

Well-defined tornadoes were reported in Nebraska on the 3d, in Iowa on the 4th, in Illinois on the 10th and 14th, in Kansas and Nebraska on the 16th, in South Dakota on the 17th, in South Carolina on the 19th, in Illinois on the 20th, in Nebraska on the 22d, and in Wisconsin on the 27th. Severe thunderstorms, resulting in damage by lightning, rain, or hail, were reported east of the Rocky Mountains on twenty-two dates; the storms were confined principally to the lower Missouri, upper Mississippi, and Ohio valleys, and the Lake region, and were reported most frequently in Iowa and Michigan.

The lower Mississippi River fell below the danger-line at New Orleans, La., on the 12th, and continued to fall slowly during the month. Floods were reported along the Carson River, in Nevada, as a result of melting snow in the Sierra Nevada Mountains, and disastrous floods, caused by heavy rain, occurred in Ontario, Can., central New York, northern Illinois, and southern Wisconsin. Drought injured crops and vegetation in areas in the south Atlantic and Gulf states, and in the lower Missouri valley.

ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for June, 1890, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on chart ii by isobars. The departure of the mean pressure for June, 1890, obtained from observations taken twice daily at the hours named from that determined from hourly observations, varied at the stations named below, as follows:

| Station. | Departure. | Station. | Departure. |
|------------------------|------------|------------------------------|------------|
| Eastport, Me. | + .006 | Duluth, Minn. | — .001 |
| Boston, Mass. | + .008 | Savannah, Ga. | — .003 |
| New York City. | + .007 | Saint Louis, Mo. | — .006 |
| Philadelphia, Pa. | + .004 | Galveston, Tex. | — .012 |
| Washington City. | + .003 | Fort Assiniboine, Mont. | — .005 |
| Buffalo, N. Y. | + .003 | Santa Fe, N. Mex. | — .008 |
| Detroit, Mich. | + .001 | Denver, Colo. | — .003 |
| Cincinnati, Ohio. | + .006 | Salt Lake City, Utah. | — .008 |
| Memphis, Tenn. | + .004 | Portland, Oregon. | — .009 |
| New Orleans, La. | + .001 | San Francisco, Cal. | — .011 |
| Chicago, Ill. | + .001 | San Diego, Cal. | — .013 |

For June, 1890, the mean pressure was highest over the southern half of Florida, where it was above 30.10, the highest mean reading, 30.11, being reported at Tampa, Fla., and the mean values were above 30.05 over the east Gulf states and eastern Tennessee and along the immediate Pacific coast north of the fortieth parallel. The mean pressure was lowest over the southwestern part of the southern plateau region and at stations in the British Northwest Territory, where it was below 29.80, and the mean readings were below 29.90 from the southern plateau region northeastward over the middle Missouri and the Red River of the North valleys.

A comparison of the pressure chart for June, 1890, with that of the preceding month shows that there was an increase of pressure from the middle and north Pacific coasts southeastward over the plateau regions and thence eastward over the Gulf States, and from the lower Missouri and Red River of the North valleys eastward, save over southern and eastern New England and the Canadian Maritime Provinces. The most marked increase in pressure occurred from the Ohio Valley southward over the east Gulf states and thence westward to New Mexico, where it exceeded .05, and the greatest decrease was reported in the upper Missouri and Red River of the North valleys and in the British Possessions to the northward, where it was more than .05. The increase in pressure over the southeastern part of the country attended the formation of an area of high pressure over southern Florida; the decrease in pressure over the north-central part of the country attended the development of an area of low pressure over the British Northwest Territory; and there was a decrease in pressure of about .05 over the southeastern part of the southern plateau region.

The mean pressure was above the normal, save over the central and north-central parts of the country, and over the southeastern part of the southern plateau region. At stations along the Atlantic coast north of the thirty-fifth parallel the mean pressure corresponded with the normal. The greatest departures above the normal pressure were noted over southern Florida and along the west Gulf coast, in the Saint Lawrence Valley and New Brunswick, and in northwestern California, where they exceeded .05, and the most marked departures below the normal pressure occurred in the middle Missouri valley, where they were more than .05.

BAROMETRIC RANGES.

The monthly barometric ranges at the several Signal Service stations are shown in the table of miscellaneous meteorological data. The general rule, to which the monthly barometric ranges over the United States are found to conform, is that they increase with the latitude and decrease slightly, though somewhat irregularly, with increasing longitude. In June, 1890, the monthly ranges were greatest in the middle Missouri valley, where they exceeded 1.00, whence they decreased eastward to less than .60 in New England, southeastward to less

than .30 over southern Florida, southward to .30 on the west Gulf coast, southwestward to less than .20 over the southeastern part of the southern plateau region, and to less than .30 on the south Pacific coast, and westward to less than .40 on the middle Pacific coast, and to .60 on the north Pacific coast. Along the Atlantic coast the monthly ranges varied from .28 at Key West, Fla., to .66 at Eastport, Me.; between the eighty-second and ninety-second meridians, .29 at Vicksburg, Miss., to .79 at Dubuque, Iowa; between the Mississippi River and the Rocky Mountains, .30 at Galveston, Tex., to 1.02 at Fort Sully, S. Dak.; in the Rocky Mountain and plateau regions, .19 at Fort Grant, Ariz., to .72 at Fort Assiniboine, Mont.; on the Pacific coast, .25 at Los Angeles, Cal., to .69 at Port Angeles, Wash.

Chart ii shows that in June, 1890, there was a range in mean pressure of .32 from southern Florida to the western part of the southern plateau region; a range of .18 from the Colorado River to the south Pacific coast; and a range of .31 from stations in the British Possessions north of the upper Missouri valley to the north Pacific coast.

AREAS OF HIGH PRESSURE.

Five areas of high pressure were observed within the limits of the United States during the month of June, three of which originated on the Pacific coast, and after remaining almost stationary in that region from two to five days passed east of the Rocky Mountains, and two of the three continued their easterly course to the Atlantic coast, while one disappeared on the eastern slope of the Rocky Mountains. Two of the areas of high pressure observed first appeared north of the Lake region and passed southeastward to the Atlantic, one of which apparently separated upon reaching the coast, one portion of the high area passing southeastward to the Florida coast, while the other passed northeastward over the Maritime Provinces. The following is a general description of the atmospheric conditions attending each area of high pressure:

I.—The month opened with an area of high pressure north of the Lake region, this condition being a continuation of the area of high pressure observed at the close of the previous month. Generally fair weather continued over the regions east of the Mississippi during the 1st and 2d, while this area drifted to the southeastward, causing a moderate and general increase of pressure along the entire Atlantic coast. On the morning of the 3d the barometer was highest near eastern New York, after which a portion of this area apparently moved northeastward over the lower Saint Lawrence valley, while at the same time there was a slight increase of pressure along the south Atlantic coast, the directions of the wind indicating a southerly movement of this secondary area which was central off the Florida coast on the 5th, and traces remained of this condition in that vicinity on the 6th. That portion of this area which passed northeastward passed over Nova Scotia and was traced to the eastward of that region on the 5th.

II.—Was also observed on the 1st, central to the west of central California. It moved slowly northward, following the coast line, and extending over the Pacific coast states from the 1st to the 4th when it reached its most northerly latitude west of Washington, from which region it passed directly eastward, crossing the Rocky Mountains during the 5th, the direction of movement being to the southeastward during the 6th and 7th, when it covered the western half of the United States, the centre reaching its most southerly limit while passing over Kansas, where the direction of movement again changed to the north of east. On the morning of the 8th this area covered the eastern portion of the United States, attended by generally clear weather, the centre being over Lake Erie, after which its course again changed to the southeast, the area covering the entire Atlantic coast, the centre of greatest pressure passing over the middle Atlantic states and thence southward off the south Atlantic coast, where it continued until the 11th.

III.—Appeared off the north Pacific coast on the 11th and continued almost stationary in that region from the 11th to the 15th, when it passed to the northern Rocky Mountain region, attended by marked decrease of pressure as compared with that observed while on the Pacific coast, and although poorly defined its movements were traced eastward over the central valleys during the 17th and over the upper lake region on the 18th, where it was apparently re-enforced from the Hudson Bay region, causing it to move southeastward over the lower lake region and the middle Atlantic states, passing to the east of the coast line during the night of the 20th, and disappearing wholly from the field of observation during the 21st. It may be observed that the two areas of high pressure which passed from the Pacific to the Atlantic passed over almost identically the same course, the direction of movement being to the north of east while on the Pacific coast and while approaching the Lake region, and to the south of east in passing over the Rocky Mountain regions and from the Lake region towards the Atlantic coast.

IV.—Appeared to the north of the Saint Lawrence Valley on the 14th, while the area of high pressure previously described was central on the north Pacific coast. It passed directly south to the Saint Lawrence Valley, and thence southeastward over New England, the maximum pressure occurring along the New England and Nova Scotia coasts on the 16th, after the centre had passed to the east of the coast line. It apparently drifted southward from the New England coast but could not be located after the 17th.

V.—Was clearly defined as central off the north Pacific coast on the 25th, although the previous reports indicate that it doubtless reached that location from the southwestward, reports from the Pacific coast as early as the 22d indicating the advance of an area of high pressure from that region. This area remained almost stationary on the north Pacific coast until the 27th, when its centre reached the forty-ninth parallel, when it extended rapidly to the southeastward, attended, however, by a marked decrease of pressure. It extended over the Rocky Mountain and plateau regions during the 28th and 29th, and at close of month there was a slight trace of it remaining over the east-central slope of the Rocky Mountains.

AREAS OF LOW PRESSURE.

Eight areas of low pressure were observed during the month of June. Compared with the previous month the weather changes have been less marked, less rapid, and there has also been a decided decrease in the number of areas of high and low pressure. No well-defined storm passed over the country south of the Lake region, no area of low pressure reached the Atlantic coast south of New York, and the region of greatest storm frequency was transferred from the lakes to the central Rocky Mountain region, and only one well-defined storm passed eastward from the Pacific coast, and that disappeared north of North Dakota.

The following is a general description of the weather conditions observed during the transit of each area of low pressure:

I.—On the first of the month the plateau and Rocky Mountain regions were included within an extended barometric depression which existed at the close of the previous month. This storm was central near Salt Lake City, Utah, at the a. m. report of the 1st, and on the succeeding day it passed eastward to Colorado, attended by high winds and severe local storms in the Dakotas and generally throughout the Northwest. These conditions continued during the 3d and 4th, the storms extending over the Lake region with considerable violence, while the centre remained in the Missouri Valley near Huron, S. Dak. The rainfall was especially heavy in the upper Mississippi and Missouri valleys. The gales were very severe on Lake Michigan, and the high winds were destructive to crops in Minnesota, the Dakotas, and Nebraska. This storm apparently developed its maximum intensity while passing eastward over Minnesota. It reached the east portion of Lake Superior on the morning of the 6th, and continued its

course to the Saint Lawrence Valley during the 7th, disappearing to the east of the Maritime Provinces during the night of the 8th. During the passage of this storm only light showers occurred on the Atlantic coast, and winds of moderate force were observed as far south as Hatteras, N. C.

II.—This storm apparently developed on the west Gulf coast on the 8th, and pursued an unusual course, passing directly north over the Mississippi Valley, reaching the vicinity of Saint Paul, Minn., on the morning of the 10th, where the direction of movement changed abruptly to east, carrying this storm directly over the upper lake region and thence to the upper Saint Lawrence valley, where it remained almost stationary for forty-eight hours, developing but slight energy, attended by an apparent southeasterly movement which could not be traced definitely after the morning of the 14th, but it apparently passed off the south New England coast.

III.—When the preceding storm was central in the lower Mississippi valley this disturbance appeared to the north of Montana, and during the 9th the two depressions apparently approached each other, one moving northward over the upper Mississippi valley, and the other extending southward over the Rocky Mountain region. After reaching western Kansas during the 10th it disappeared by gradual decrease of pressure and could not be traced beyond that region.

IV.—Apparently developed over Montana on the 11th, and after passing eastward to the Dakotas two disturbances formed, one passing to the Missouri Valley near Omaha, Nebr., and the other appearing far to the north of North Dakota on the morning of the 13th. The disturbance in the Missouri Valley divided during the 13th, the principal disturbance passing over Iowa, while the secondary moved southward over Kansas, and disappeared during the 14th. The principal disturbance after reaching the vicinity of Saint Paul, Minn., apparently united with the one previously noted as central to the north of North Dakota, and could not be traced from the telegraphic reports after the morning of the 15th. Although this storm did not move to the east of the Mississippi, it was immediately followed by heavy local rains in the Ohio Valley.

V.—This disturbance developed over northern California on the 16th and was preceded by a slight disturbance in Colorado on the 15th, which is not traced on chart i. It passed northeastward to the northern plateau region on the 17th, and thence southeastward to the central Rocky Mountain region on the 18th, where it remained almost stationary until the afternoon of the 19th, attended by heavy local rains from Texas northward to the Dakotas. These rains extended eastward to the upper lake region on the 20th when the centre of disturbance passed to North Dakota. The rainfall attending this storm in northwest North Dakota was especially heavy over a region which had been previously suffering from drought, the previous seasonal rainfall in that section being about 35 per cent. of the normal, while the recent rains have brought the seasonal rainfall up to more than 90 per cent. This storm disappeared to the north of Minnesota on the 21st.

VI.—Was first observed north of the Saint Lawrence Valley, and although it had but slight influence on the weather conditions of the United States, the telegraphic reports indicate that it passed southward to the Maine coast and thence southeastward off the Nova Scotia coast during the 18th and 19th. It was a disturbance of slight energy, although well defined, but the general rains attending it did not extend as far south as Portland, Me., nor to the westward of Quebec, Quebec.

VII.—This storm developed over the central Rocky Mountain region on the 21st and probably within the southern extremity of the barometric trough which attended the disturbance traced as number v. It covered the greater portions of the plateau and Rocky Mountain regions on the 22d, and remained almost stationary in this section until the 25th, with an apparent tendency, however, to move to the northward. It was attended by generally fair and warm weather throughout the central valleys, although local rains and thunderstorms occurred in the Northwest on the 23d and 25th, and

in the Lake region on the 26th. This disturbance passed to the north of Minnesota, but the centre could not be located after the 26th.

VIII.—Appeared far to the north of the lower lake region on the 24th, and passed directly southeastward to the New

England coast during the succeeding twenty-four hours. It was attended by light rains and thunder-storms in New England during the 25th and remained practically stationary over Nova Scotia from the 25th to the 28th without causing any marked disturbance.

Tabulated statement showing principal characteristics of areas of high and low pressure.

| Barometer. | First observed. | | | Last observed. | | | Duration. | Velocity per hour. | Maximum abnormal changes in pressure in twelve hours, with maximum abnormal changes in temperature and maximum wind velocities in connection therewith. | | | | | | | | | |
|-------------|-----------------|---------|----------|----------------|----------|-------|-----------|--------------------|---|----------------------------|-------|-------|----------------------------|-------|-----------------|------------|---------------------------|-------|
| | Date. | Lat. N. | Long. W. | Lat. N. | Long. W. | | | | Rise. | Station. | Date. | Fall. | Station. | Date. | Miles per hour. | Direction. | Station. | Date. |
| High areas. | | | | | | Days. | Miles. | Inch. | | | | | | | | | | |
| I..... | *30 | 54 | 108 | 45 | 76 | 6.0 | 22 | .42 | | Swift Current, N. W. T.... | *29 | 27 | Chicago, Ill..... | *31 | 40 | ne. | Fort Buford, N. Dak..... | *31 |
| II..... | 1 | 37 | 126 | 30 | 76 | 7.0 | 20 | .47 | | Rockliffe, Ont..... | 7 | 26 | Montrose, Colo..... | 3 | 54 | n. | Galveston, Tex..... | 6 |
| III..... | 11 | 42 | 128 | 40 | 71 | 10.0 | 18 | .36 | | Rapid City, S. Dak..... | 13 | 24 | Duluth, Minn..... | 16 | 60 | nw. | Detroit, Mich..... | 17 |
| IV..... | 14 | 59 | 77 | 37 | 69 | 3.5 | 23 | .90 | | Chatham, N. H..... | 15 | 8 | Eastport, Me..... | 16 | 52 | nw. | Hatteras, N. C..... | 15 |
| V..... | 25 | 43 | 127 | 40 | 104 | 5.5 | 14 | .38 | | Calgary, N. W. T..... | 30 | 24 | Santa Fe, N. Mex..... | 25 | 48 | n. | Valentine, Nebr..... | 28 |
| Mean..... | | 46 | 113 | 36 | 76 | 6.8 | 20 | .36 | | | | 22 | | | 51 | | | |
| Low areas. | | | | | | | | | Fall. | | | Rise. | | | | | | |
| I..... | 1 | 41 | 112 | 48 | 59 | 7.0 | 20 | .30 | | Winnipeg, Man..... | 1 | 17 | Marquette, Mich..... | 3 | 66 | sw. | Fort Sully, S. Dak..... | 4 |
| II..... | 2 | 38 | 95 | 44 | 75 | 5.0 | 21 | .30 | | Montreal, Quebec..... | 10 | 15 | Fort Sully, S. Dak..... | 10 | 39 | w. | Harrisburg, Pa..... | 12 |
| III..... | 8 | 54 | 112 | 37 | 101 | 2.0 | 30 | .40 | | Swift Current, N. W. T.... | 8 | 22 | Swift Current, N. W. T.... | 8 | 76 | nw. | Fort Assiniboine, Mont. | 9 |
| IV..... | 11 | 47 | 107 | 53 | 92 | 3.5 | 14 | .26 | | Concordia, Kans..... | 11 | 23 | Pueblo, Colo..... | 12 | 56 | w. |do..... | 13 |
| V..... | 16 | 40 | 122 | 53 | 97 | 5.0 | 21 | .36 | | Qu'Appelle, N. W. T..... | 11 | 23 | Spokane Falls, Wash..... | 15 | 52 | w. |do..... | 21 |
| VI..... | 17 | 33 | 87 | 44 | 63 | 1.5 | 24 | .28 | | Port Sully, S. Dak..... | 17 | 26 | Father Point, Quebec..... | 16 | 45 | e. | Father Point, Quebec..... | 18 |
| VII..... | 21 | 39 | 104 | 51 | 90 | 5.0 | 9 | .34 | | Montreal, Quebec..... | 17 | 14 | Denver, Colo..... | 22 | 70 | se. | Yankton, S. Dak..... | 23 |
| VIII..... | 24 | 30 | 76 | 43 | 60 | 4.0 | 12 | .22 | | Fort Custer, Mont..... | 24 | 19 | Block Island, R. I..... | 25 | 34 | nw. | New York City..... | 26 |
| Mean..... | | 44 | 99 | 46 | 82 | 4.0 | 18 | .31 | | | | 18 | | | 55 | | | |

* May.

NORTH ATLANTIC STORMS FOR JUNE, 1890 (pressure in inches and millimetres; wind-force by Beaufort scale).

The paths of the depressions that appeared over the north Atlantic ocean during June, 1890, are shown on chart i. These paths have been determined from international observations by captains of ocean steamships and sailing vessels received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

Ten depressions have been traced for the current month, four of which were continuations of areas of low pressure which first appeared over the North American continent, two developed over or near Newfoundland, one about midway between Newfoundland and the Azores, and three to the westward or northwestward of the British Isles. The depressions generally pursued normal east to northeast paths, and no storms traversed the ocean from coast to coast. Compared with the storms traced for June during the last seven years, the depressions noted for the current month, while exceeding in number the average for the period named, were deficient in energy, and gales of unusual strength were not encountered along the trans-Atlantic steamship routes.

The month opened with a depression central on the west coast of Newfoundland, where the pressure fell to about 29.55 (749), and a second depression was central northeast of the Grand Banks. During the 2d and 3d the depression first referred to moved slowly northeastward over Newfoundland, with an apparent slight increase in pressure, and by the 4th had advanced eastward over mid-ocean near the fiftieth parallel, after which it probably moved northeastward beyond the region of observation. During the 2d and 3d the pressure fell rapidly to the west of the British Isles, and on the latter-named date fresh to strong gales and pressure falling to about 29.49 (747), were reported off the Irish coast, and on the 4th a depression of considerable strength was central northwest of Ireland. From the 8th to 10th a depression which was a continuation of low area i moved from the Gulf of Saint Lawrence northeastward over Newfoundland, after which it apparently recurved to the southward and united with a depression which was central on the 11th south of Newfoundland. From

the 9th to 11th fresh to strong gales prevailed east of the twenty-fifth meridian under the influence of a depression which first appeared east of the Grand Banks on the 4th, and moved thence northeastward north of the fifty-fifth parallel by the 9th, whence it passed southeastward to Ireland by the 11th, and thence eastward over the British Isles. From the 11th to 13th a depression advanced from south of Newfoundland east-northeast to mid-ocean, with pressure falling to or below 29.50 (749), and fresh to strong gales over mid-ocean on the latter-named date, after which it disappeared north of the region of observation. On the 15th a depression, which was probably a continuation of low area ii, was central on the south coast of Newfoundland, whence it moved east-northeast, and on the 17th was attended over mid-ocean by fresh to strong gales and pressure falling to about 29.40 (747), after which it disappeared north of the region of observation. From the 19th to the 21st a depression, which was a continuation of low area vi, moved east-northeast from south of Nova Scotia to the fiftieth parallel, attended by fresh to strong gales, after which it disappeared north of the region of observation. From the 25th to 29th fresh to strong gales and pressure varying from 29.50 (749) to 29.90 (754) attended the passage of low area viii which advanced from the Saint Lawrence Valley to the New England coast, thence eastward to Nova Scotia, over and south of which province it pursued an irregular course until the evening of the 28th, and thence northeastward over Newfoundland as depression number 9 during the 29th and 30th. On the 25th a depression was central south or southeast of Iceland, whence it moved eastward and disappeared north of the British Isles after the 26th. During the 29th and 30th a depression of considerable energy moved southeastward west of British Isles, and on the latter-named date was attended by pressure falling to about 29.40 (747) and fresh to strong gales.

Reports of the last seven years show that severe storms seldom occur in the tropical or sub-tropical regions of the north Atlantic ocean or over the Gulf of Mexico in June, and that in 1886 and 1889 only were depressions of marked strength

located in those regions. In 1886 three energetic storms traversed the Gulf of Mexico, the first of which moved north and northeast over the west Gulf during the 13th and 14th, attended by destructive gales along the west Gulf coast; from the 19th to 21st a depression moved from the western part of the Caribbean Sea northward over western Florida, attended by heavy rain in Cuba and dangerous gales over the eastern Gulf; and from the 27th to 30th a depression moved from the Caribbean Sea, near Jamaica, over northeastern Yucatan and thence recurved north and northeast over the Gulf to northern Florida, attended by severe gales and heavy rain. In 1889 a depression which originated over the western Caribbean sea moved northward between Cuba and Yucatan and recurved northeast over Florida from the 15th to 17th, accompanied by heavy rain and high winds. The most destructive storm noted for June over the western part of the north Atlantic ocean in recent years moved eastward from the New Jersey coast on June 5, 1885, and thence passed eastward to the Grand Banks by the 7th. This storm was considered the most disastrous that had visited the Newfoundland coast in forty years, and it was estimated that more than fifty vessels were totally wrecked, while a large number were driven ashore and more or less damaged.

OCEAN ICE IN JUNE.

The following table shows the southern and eastern limits of the region within which icebergs or field ice were reported for June, during the last eight years:

| Southern limit. | | | Eastern limit. | | |
|-----------------|---------|----------|-----------------|---------|----------|
| Month. | Lat. N. | Long. W. | Month. | Lat. N. | Long. W. |
| June, 1883..... | 40 26 | 51 45 | June, 1883..... | 48 14 | 42 43 |
| June, 1884..... | 40 42 | 47 49 | June, 1884..... | 44 00 | 45 23 |
| June, 1885..... | 39 36 | 48 12 | June, 1885..... | 45 14 | 41 12 |
| June, 1886..... | 40 30 | 53 00 | June, 1886..... | 49 15 | 40 00 |
| June, 1887..... | 40 40 | 48 34 | June, 1887..... | 43 22 | 39 19 |
| June, 1888..... | 43 35 | 43 24 | June, 1888..... | 43 35 | 43 24 |
| June, 1889..... | 42 54 | 49 54 | June, 1889..... | 46 57 | 40 29 |
| June, 1890..... | 40 01 | 52 00 | June, 1890..... | 46 08 | 37 07 |

*On the 10th a small block of ice was reported in N. 46° 28', W. 28° 34'.

The above table shows that for June, 1890, ice was reported about one and one-half degree south and nearly three and one-half degrees east of the average southern and eastern limits of Arctic ice for the corresponding month of the last seven years. The southernmost ice reported was a small iceberg on the 16th, and the easternmost ice reported was a medium-sized iceberg on the 3d, in the positions given. As shown by the note under the table a block of ice was reported about eight and one-half degrees farther east than the easternmost iceberg noted. In but one year, 1885, has ice been reported farther south, and the easternmost iceberg reported for the current month was more than two degrees farther east than the east-

ernmost ice reported for June of preceding years, and in but one preceding year, 1887, has Arctic ice been reported east of the fortieth meridian. As regards quantity, the ice reported for the current month was largely in excess of the average for June of preceding years. From the 17th to the 20th a vessel effected the passage of the Straits of Belle Isle, and the captain reports that for thirty miles east of Belle Isle large icebergs and field ice were observed, and that thirty hours were required to make the passage from Cape Norman to Greenlet Island on account of the straits being blocked with ice. On the 29th numerous icebergs were reported from thirty miles east-northeast of Belle Isle to the Straits of Belle Isle, also a large patch of detached ice twelve miles east of Belle Isle; from Belle Isle to Point Amour there were numerous large icebergs thickly packed with small pieces of ice; and icebergs were observed one hundred and twenty-six miles from Point Amour on a course to Heath Point, Anticosti Island.

FOG IN JUNE.

The limits of fog belts west of the fortieth meridian are shown on chart i by dotted shading. In the vicinity of the Banks of Newfoundland fog was reported on sixteen dates; between the fifty-fifth and sixty-fifth meridians on fifteen dates; and west of the sixty-fifth meridian on nine dates. Compared with the corresponding month of the last two years the dates of occurrence of fog near the Grand Banks numbered five less than the average; between the fifty-fifth and sixty-fifth meridians the same as the average; and west of the sixty-fifth meridian seven less than the average. On all dates for which fog was reported near the Banks of Newfoundland it was noted in the eastern quadrants of areas of low pressure advancing from the westward. With the exception of the 4th and 5th, when falling barometer, threatening weather, and rain prevailed in that region, the fog reported between the fifty-fifth and sixty-fifth meridians attended the approach or passage to the northward of areas of low pressure. West of the sixty-fifth meridian fog occurred with the approach or passage of areas of low pressure, save on the 5th, when falling barometer and threatening weather prevailed in that region. The reports of Signal Service observers show that on the 4th dense fog prevailed on the Massachusetts coast with southeast wind and rain; on the 5th on the Connecticut and Rhode Island coasts with southeast wind and rain; on the 6th at New York City with a low pressure storm in the Saint Lawrence Valley; on the 7th and 12th on the Massachusetts, Rhode Island, and New York coasts with low pressure storms in the Saint Lawrence Valley; on the 13th, 14th, and 18th along the southern New England coast with low pressure storms in the Saint Lawrence Valley; on the 19th on the coast of eastern Maine with a low pressure storm over Nova Scotia; on the 24th from Maine to New Jersey with a low pressure storm in the Saint Lawrence Valley; and on the 25th on the coasts of Rhode Island and New York with a low pressure storm in the Saint Lawrence Valley.

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

The distribution of mean temperature over the United States and Canada for June, 1890, is exhibited on chart ii by dotted isotherms. In the table of miscellaneous meteorological data the monthly mean temperature and the departure from the normal are given for regular stations of the Signal Service. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the departure is below the normal and subtracting when above. The monthly mean temperature for regular stations of the Signal Service represents the mean of the maximum and minimum temperatures.

For June, 1890, the mean temperature was highest over

southwestern Arizona and the adjoining part of California, where it was above 85°, and the mean values were generally above 80° in the Atlantic coast states south of the thirty-fifth parallel, and south of a line traced irregularly westward over the Gulf States to the middle Rio Grande valley. The mean temperature was also above 80° from southwestern Arizona and southeastern California northward over southern Nevada. The mean temperature was lowest at the more elevated stations in west-central Colorado and in extreme northwestern Washington, where it was below 50°, and the mean readings were below 60° in the Canadian Maritime Provinces, Maine, extreme northern Michigan, northeastern Minnesota, from western Montana southeastward to south-central Colorado and southwestward to west-central Nevada, in central Nevada, and

southwestern Utah, and at Pacific coast stations from San Francisco, Cal., northward.

Except in New England, the Saint Lawrence Valley, and the Canadian Maritime Provinces the mean temperature was above the normal east of a line traced from the British Possessions north of Montana southeastward to southern Florida, while to the westward of this line the month was cooler than the average June, save at stations on the Pacific coast between the thirty-fifth and forty-fifth parallels. The most marked departures above the normal temperature occurred in the lower valley of the Red River of the North, where they exceeded 5°, and the excesses in temperature exceeded 4° from the upper lake region southward over the lower Ohio and upper Mississippi valleys. The greatest departures below the normal temperature were noted in eastern New Brunswick and Nova Scotia, where they were more than 4°, and the deficiencies in temperature exceeded 3° within an area extending from southwestern Idaho southward to central New Mexico.

The following are some of the most marked departures from the normal at the older established stations:

| Above normal. | Below normal. |
|-------------------------------|----------------------------------|
| Saint Vincent, Minn. 6.8 | Halifax, N. S. 5.0 |
| Parry Sound, Ont. 5.0 | Boise City, Idaho. 2.4 |
| Keokuk, Iowa. 5.2 | San Antonio, Tex. 3.6 |
| Augusta, Ga. 4.2 | Whipple Barracks, Ariz. 3.4 |

At stations in the south Atlantic states, Arkansas, Kansas, the Ohio Valley and Tennessee, the Lake region, and the upper Mississippi and Red River of the North valleys the mean temperature was the highest, while at stations in the northern plateau region and on the north Pacific coast the mean temperature was the lowest reported for June during the respective periods of observation. At Atlanta, Ga., twelve years record, the mean for the current month, 78°.8, was 1°.2 above the highest mean temperature previously reported for June, noted in 1881; Augusta, Ga., twenty years record, 83°.2, 0°.9 above mean of 1881; Charleston, S. C., twenty years record, 82°.2, 0°.5 above mean of 1881; Charlotte, N. C., twelve years record, 80°.2, 1°.3 above mean of 1881; Merritt's Island, Fla., six years record, 83°.4, 2°.4 above mean of 1887; Southport, N. C., fifteen years record, 79°.4, 0°.7 above mean of 1876; Wilmington, N. C., twenty years record, 80°.1, 0°.1 above mean of 1871; Chattanooga, Tenn., twelve years record, 78°.9, 2°.6 above mean of 1881; Wauseon, Ohio, twenty years record, 72°.8, 0°.4 above mean of 1873; Columbus, Ohio, twelve years record, 74°.6, 1°.8 above mean of 1880; North Lewisburgh, Ohio, fifty-eight years record, 77°.5, 3°.5 above mean of 1865; Fort Smith, Ark., nine years record, 78°.3, the same as mean of 1882; Indianapolis, Ind., 76°.7, the same as mean of 1873; Grampian Hills, Pa., twenty-five years record, 70°.0, the same as mean of 1865; Knoxville, Tenn., twenty years record, 77°.5, 1°.1 above mean of 1874; Wellington, Kans., eleven years record, 81°.4, 3°.0 above mean of 1881; Alpena, Mich., eighteen years record, 63°.4, 0°.7 above mean of 1876; Cleveland, Ohio, twenty years record, 70°.4, the same as mean of 1873; Detroit, Mich., twenty years record, 71°.6, 1°.2 above mean of 1884; Escanaba, Mich., twenty years record, 65°.4, 0°.6 above mean of 1880; Grand Haven, Mich., twenty years record, 68°.0, the same as mean of 1884; Milwaukee, Wis., twenty years record, 67°.9, 0°.8 above means of 1873 and 1880; Port Huron, Mich., sixteen years record, 67°.4, 0°.9 above mean of 1880; Sandusky, Ohio, twelve years record, 72°.8, 2°.0 above mean of 1880; Thornville, Mich., thirteen years record, 71°.7, 1°.3 above mean of 1880; Cairo, Ill., nineteen years record, 79°.4, 1°.9 above means of 1873 and 1881; Des Moines, Iowa, twelve years record, 73°.2, 1°.3 above mean of 1887; Dubuque, Iowa, seventeen years record, 73°.6, 1°.2 above mean of 1874; Saint Vincent, Minn., ten years record, 68°.8, 2°.6 above mean of 1884; and Springfield, Ill., eleven years record, 76°.0, 2°.7 above mean of 1880. At Portland, Me., twenty years record, the mean temperature for the cur-

rent month, 60°.6, was 0°.2 lower than the lowest mean temperature previously reported for June, noted in 1881 and 1886; Boise City, Idaho, thirteen years record, 62°.6, 0°.2 below mean of 1887; Tatoosh Island, Wash., seven years record, 47°.4, 4°.9 below mean of 1887; and Sacramento, Cal., thirty-seven years record of voluntary observers, 64°.4, 1°.2 below mean of 1889.

DEVIATIONS FROM NORMAL TEMPERATURES.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for June for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for June, 1890; (4) the departure of the current month from the normal; (5) and the extreme monthly means for June, during the period of observation and the years of occurrence:

| State and station. | County. | (1) Normal for the month of June. | (2) Length of record. | (3) Mean for June, 1890. | (4) Departure from normal. | (5) Extreme monthly mean temperature for June. | | | |
|------------------------|-------------------|-----------------------------------|-----------------------|--------------------------|----------------------------|--|-----------|---------|-------|
| | | | | | | Highest. | Year. | Lowest. | Year. |
| <i>Arkansas.</i> | | | | | | | | | |
| Lead Hill | Boone | 76.6 | 8 | 80.1 | + 3.5 | 80.2 | 1885 | 74.9 | 1889 |
| <i>California.</i> | | | | | | | | | |
| Sacramento | Sacramento .. | 70.2 | 37 | 64.4 | - 5.8 | 77.0 | 1853 | 64.4 | 1890 |
| <i>Connecticut.</i> | | | | | | | | | |
| Middletown | Middlesex | 66.5 | 23 | 66.5 | 0.0 | 72.6 | 1876 | 62.9 | 1863 |
| <i>Florida.</i> | | | | | | | | | |
| Merritt's Island .. | Brevard | 78.8 | 8 | 83.4 | + 4.6 | 83.4 | 1890 | 75.4 | 1889 |
| <i>Georgia.</i> | | | | | | | | | |
| Forsyth | Monroe | 76.3 | 16 | 81.4 | + 5.1 | 81.9 | 1880, '81 | 74.2 | 1884 |
| <i>Illinois.</i> | | | | | | | | | |
| Peoria | Peoria | 73.8 | 34 | 78.9 | + 5.1 | 79.7 | 1873 | 69.4 | 1869 |
| Riley | McHenry | 60.7 | 34 | 70.0 | + 3.3 | 73.9 | 1856 | 62.1 | 1862 |
| <i>Indiana.</i> | | | | | | | | | |
| Vevay | Switzerland .. | 73.3 | 24 | 77.4 | + 4.1 | 77.9 | 1867 | 68.4 | 1869 |
| <i>Iowa.</i> | | | | | | | | | |
| Cresco | Howard | 66.0 | 17 | 68.6 | + 2.6 | 72.0 | 1873 | 62.8 | 1877 |
| Monticello | Jones | 65.4 | 36 | 73.2 | + 7.8 | 74.0 | 1856 | 64.1 | 1863 |
| Logan | Harrison | 69.9 | 16 | 72.8 | + 2.9 | 74.4 | 1887 | 64.5 | 1876 |
| <i>Kansas.</i> | | | | | | | | | |
| Lawrence | Douglas | 73.5 | 21 | 77.0 | + 3.5 | 77.2 | 1881 | 69.8 | 1879 |
| Wellington | Sumner | 73.2 | 11 | 81.4 | + 8.2 | 81.4 | 1890 | 65.8 | 1889 |
| <i>Louisiana.</i> | | | | | | | | | |
| Grand Coteau* .. | Saint Landry .. | 79.6 | 7 | ..... | ..... | ..... | ..... | ..... | ..... |
| <i>Maine.</i> | | | | | | | | | |
| Orono | Penobscot | 62.1 | 20 | 59.5 | - 2.6 | 64.8 | 1884, '89 | 57.5 | 1881 |
| <i>Maryland.</i> | | | | | | | | | |
| Cumberland | Allegany | 68.5 | 30 | 72.6 | + 4.1 | 74.0 | 1874 | 63.5 | 1863 |
| <i>Massachusetts.</i> | | | | | | | | | |
| Amherst* | Hampshire | 66.6 | 54 | ..... | ..... | ..... | ..... | ..... | ..... |
| Newburyport | Essex | 65.2 | 12 | 63.2 | - 2.0 | 68.3 | 1883 | 59.4 | 1881 |
| Somerset | Bristol | 68.8 | 18 | 67.8 | - 1.0 | 72.2 | 1876 | 64.3 | 1881 |
| <i>Michigan.</i> | | | | | | | | | |
| Kalamazoo | Kalamazoo | 66.8 | 13 | 69.0 | + 2.2 | 70.0 | 1887 | 63.7 | 1889 |
| Thornville | Lapeer | 67.4 | 13 | 71.7 | + 4.3 | 71.7 | 1890 | 64.1 | 1881 |
| <i>Minnesota.</i> | | | | | | | | | |
| Minneapolis | Hennepin | 66.6 | 25 | 69.2 | + 2.6 | 72.0 | 1873 | 61.9 | 1877 |
| <i>Montana.</i> | | | | | | | | | |
| Fort Shaw | Lewis & Clarke .. | 62.7 | 21 | 60.4 | - 2.3 | 70.6 | 1871 | 58.1 | 1877 |
| <i>New Hampshire.</i> | | | | | | | | | |
| Hanover | Grafton | 64.0 | 56 | 63.5 | - 0.5 | 69.8 | 1870 | 57.9 | 1839 |
| <i>New Jersey.</i> | | | | | | | | | |
| Moorestown | Burlington | 70.3 | 27 | 71.2 | + 0.9 | 73.8 | 1865 | 66.3 | 1886 |
| South Orange | Essex | 69.0 | 18 | 69.1 | + 0.1 | 73.6 | 1876 | 63.4 | 1881 |
| <i>New York.</i> | | | | | | | | | |
| Cooperstown | Otsego | 64.0 | 36 | 65.4 | + 1.4 | 71.9 | 1870 | 57.3 | 1863 |
| Palermo | Oswego | 64.5 | 36 | 66.4 | + 1.9 | 71.6 | 1870 | 59.4 | 1855 |
| <i>North Carolina.</i> | | | | | | | | | |
| Lenoir | Caldwell | 70.0 | 18 | 73.8 | + 3.8 | 75.0 | 1874 | 63.6 | 1887 |
| <i>Ohio.</i> | | | | | | | | | |
| N'th Lewisburgh .. | Champaign | 68.9 | 58 | 77.5 | + 8.6 | 77.5 | 1890 | 61.0 | 1879 |
| Wauseon | Fulton | 68.2 | 20 | 72.8 | + 4.6 | 72.8 | 1890 | 64.8 | 1889 |
| <i>Oregon.</i> | | | | | | | | | |
| Albany | Linn | 61.8 | 11 | 63.3 | + 1.5 | 66.1 | 1889 | 59.1 | 1880 |
| Eola | Polk | 59.9 | 20 | 58.0 | - 1.9 | 65.0 | 1889 | 54.5 | 1873 |
| <i>Pennsylvania.</i> | | | | | | | | | |
| Dyberry | Wayne | 64.1 | 23 | 64.0 | - 0.1 | 68.2 | 1870 | 60.4 | 1881 |
| Grampian Hills | Clearfield | 66.3 | 25 | 70.0 | + 3.7 | 70.0 | 1865, '90 | 61.3 | 1878 |
| Wellaborough | Tioga | 66.1 | 11 | 64.5 | - 1.6 | 74.6 | 1883 | 61.1 | 1881 |
| <i>South Carolina.</i> | | | | | | | | | |
| Statesburgh | Sumter | 76.1 | 9 | 78.5 | + 2.4 | 80.5 | 1881 | 72.4 | 1884 |
| <i>Tennessee.</i> | | | | | | | | | |
| Austin | Wilson | 76.0 | 19 | 80.6 | + 4.6 | 85.5 | 1874 | 72.1 | 1878 |
| <i>Texas.</i> | | | | | | | | | |
| New Ulm | Anstlin | 80.2 | 17 | 80.4 | + 0.2 | 85.0 | 1881 | 77.4 | 1889 |
| <i>Vermont.</i> | | | | | | | | | |
| Strafford | Orange | 66.0 | 17 | 63.8 | - 2.2 | 71.1 | 1884 | 58.4 | 1881 |
| <i>Virginia.</i> | | | | | | | | | |
| Birdnest | Northampton .. | 74.4 | 23 | 76.3 | + 1.9 | 77.7 | 1830 | 70.4 | 1887 |
| <i>Wisconsin.</i> | | | | | | | | | |
| Madison | Dane | 67.6 | 18 | 70.6 | + 3.0 | 72.4 | 1873 | 62.5 | 1869 |
| <i>Washington.</i> | | | | | | | | | |
| Fort Townsend .. | Jefferson | 59.1 | 17 | 56.3 | - 2.8 | 61.7 | 1888 | 56.0 | 1879 |

* Not received.

MAXIMUM AND MINIMUM TEMPERATURES.

The highest temperature reported by a regular station of the Signal Service was 107° at Yuma, Ariz., on the 7th; the maximum temperature rose to, or above, 100° in the Gila Valley, in the Colorado Valley from southern Nevada southward, from the upper San Joaquin valley southward over southern California, in the middle Sacramento valley, Cal., at Walla Walla, Wash., El Paso, Tex., Rio Grande City, Tex., Fort Sill, Ind. T., Dodge City, Kans., Fort Smith, Ark., and Columbia, Mo.; and the maximum values were generally above 90° south of a line traced from the coast of southern New Jersey northward over the Lake region, and in all districts west of the Mississippi River, save from eastern Montana southward to central New Mexico and Arizona, and at stations along the immediate Pacific coast north of the thirty-fifth parallel. The lowest maximum temperature reported was 64° at Tatoosh Island, Wash.; at Eureka, Cal., the maximum temperature was 65°; and the maximum readings were below 80° along the immediate Pacific coast north of San Francisco, Cal., and in eastern and southeastern New England. The reports of United States Army post surgeons and state weather service and voluntary observers show the following maximum temperatures in states and territories where temperature rising to, or above, 100° was reported: Collyer, Kans., 120°; Volcano Springs, Cal., 118°; Texas Hill, Ariz., 114°; El Dorado Canyon, Nev., 109°; Bennet, Colo., Ansley and Thedford, Nebr., 108°; Tipton, Pa., and Fort Hancock, Tex., 107°; Lead Hill Ark., Glenwood, Iowa, and Eldon, Mo., 106°; Athens (2) and Millen, Ga., 105°; East Peoria and Pontiac, Ill., Huntingburgh and Muncie, Ind., Columbus and Water Valley, Miss., Glendive, Mont., Fort Selden, N. Mex., Dyersburgh, Tenn., Saint George, Utah, and Fort Fetterman, Wyo., 104°; Evergreen, Ala., Grant's Pass, Oregon, Cheraw, S. C., and Grantsburgh, Wis., 103°; Guthrie, Ind. T., Chapel Hill, N. C., Fort Bennett, S. Dak., Nottaway C. H., Va., and North Yakima, Wash., 102°; Lewiston, Idaho, Murray, Ky., Cameron and Mandeville, La., and Wapakoneta, Ohio, 101°; Bangor, Mich., and Grand Meadow, Minn., 100°.

At the following named stations of the Signal Service the maximum temperature for the current month was as high or higher than previously reported for June: Wilmington, N. C., twenty years record, 100°, the same as maximum of 1880; Atlanta, Ga., twelve years record, 98°, 1° above maximum of 1887; Palestine, Tex., nine years record, 94°, 3° above maximum of 1889; Indianapolis, Ind., twenty years record, 97°, 1° above maximum of 1888; Detroit, Mich., twenty years record, 94°, the same as maximum of 1888; Escanaba, Mich., twenty years record, 96°, 8° above maximum of 1874; Port Huron, Mich., sixteen years record, 94°, 1° above maximum of 1888; Milwaukee, Wis., twenty years record, 95°, 1° above maximum of two or more preceding years; Saint Vincent, Minn., ten years record, 94°, 1° above maximum of 1887; Saint Paul, Minn., twenty years record, 94°, the same as maximum of 1874; Davenport, Iowa, twenty years record, 98°, 1° above maximum of 1887; Keokuk, Iowa, nineteen years record, 98°, 2° above maximum of 1873; Cairo, Ill., nineteen years record, 96°, the same as maximum of 1887; Springfield, Ill., eleven years record, 97°, 1° above maximum of 1887; Saint Louis, Mo., twenty years record, 98°, the same as maximum of 1881; Omaha, Nebr., twenty years record, 98°, the same as maximum of 1881; Dodge City, Kans., sixteen years record, 102°, the same as maximum of 1880; Los Angeles, Cal., thirteen years record, 105°, 1° above maximum of 1879. The highest temperature ever reported for any month at a regular station of the Signal Service was 119° at Fort McDowell, Ariz., in June, 1887, and at Phoenix, Ariz., in June, 1883. Among extremely high temperatures reported for June of preceding years by United States Army post surgeons and voluntary observers are: 121° at Fort Miller, Cal., in 1853; 120° at Fort McRae, N. Mex., in 1873; 120° at Volcano Springs, Cal., in 1889; and 119° at Fort Mojave, Ariz., in 1876.

The lowest temperature reported by regular stations of the Signal Service was 30°, at Fort Maginnis, Mont., Cheyenne

and Fort McKinney, Wyo., Carson City, Nev., and Taylor's Ranch, Utah, and the minimum temperature fell below 40° over northern New England, in the Saint Lawrence Valley, over a greater part of Michigan, at Saint Vincent, Minn., over a greater part of the plateau region, and on the Pacific coast north of the mouth of the Columbia River. The highest minimum temperature, 71°, was reported at Jupiter, Fla., and the minimum temperature was 70° at Key West and Pensacola, Fla. The reports of United States Army post surgeons and state weather service and voluntary observers show the following minimum temperatures in states and territories where temperature falling to, or below, 32° was reported: Breckenridge, Colo., 12°; Alma Colo., 21°; Alliance, Nebr., 32°; Chama, N. Mex., 23°; Bonanza and Era, Idaho, Ely and Ruby Hill, Nev., 24°; Fort D. A. Russell, Wyo., 25°; Berlin Falls, N. H., Jordan Valley, Oregon, and Mount Pleasant, Utah, 26°; Weymouth, Ohio, and Christiansburgh, Va., 37°; Newhall, Cal., Fort Logan, Mont., Aberdeen, S. Dak., and Fort Canby, Wash., 30°; Ewart and Roscommon, Mich., and Constableville, N. Y., 31°. At the following-named stations the minimum temperature for the current month was as low or lower than previously reported for June: Rio Grande City, Tex., fourteen years record, 62°, the same as minimum of 1877; Denver, Colo., nineteen years record, 37°, the same as minimum of two or more preceding years; Tatoosh Island, Wash., six years record, 34°, 11° below minimum of 1886; Red Bluff, Cal., thirteen years record, 47°, the same as minimum of 1880; Sacramento, Cal., thirteen years record, 44°, 3° below minimum of 1887. In the south Atlantic states the lowest temperatures previously noted for June occurred generally in 1884 and 1889; in the east Gulf states and the Ohio Valley and Tennessee, in 1889; in the Rio Grande Valley, in 1877; and in the extreme northwest, in 1883 and 1888; elsewhere the periods of occurrence were irregular.

RANGES OF TEMPERATURE.

The greatest and least daily ranges of temperature at regular stations of the Signal Service are given in the table of miscellaneous meteorological data. The greatest monthly ranges of temperature occurred in the Rocky Mountain and plateau regions, where, at stations, they equalled or exceeded 60°, whence they decreased eastward to less than 30° on the coast of southeastern New England, southeastward to less than 20° over extreme southern Florida, southward to less than 30° on the west Gulf coast, to less than 40° in the lower Rio Grande valley and at stations in southeastern Arizona, southwestward to less than 50° on the extreme south Pacific coast, and westward to less than 30° on the immediate Pacific coast north of the fortieth parallel.

The following are some of the extreme monthly ranges:

| Greatest. | | Least. | |
|---------------------------|------|-----------------------|------|
| | ° | | ° |
| Taylor's Ranch, Utah..... | 63.0 | Key West, Fla..... | 19.0 |
| Baker City, Oregon..... | 60.0 | Eureka, Cal..... | 30.0 |
| Fort Thomas, Ariz..... | 60.0 | Fort Canby, Wash..... | 22.0 |
| Port Huron, Mich..... | 54.0 | Nantucket, Mass..... | 26.0 |

FROST.

The following is a summary of reports of damaging frost made by regular and voluntary observers of the Signal Service: On the 3d, 12th, and 13th frost caused some injury to plants at Beaver, Idaho. On the 4th frost killed tender vegetables and plum and apricot blossoms at Mount Pleasant, Utah. In Colorado from the 4th to the 9th low temperature prevailed; frost was reported at stations east of the mountains, and in Larimer and Weld counties slight damage was caused to garden vegetables, grape vines, etc. On the 8th frost injurious to grain was reported at North Hammond, N. Y. On the 8th frost was reported in several sections of Michigan. On the 10th frost killed tender vegetables at Show Low, Ariz. On the 14th frost injured vegetation and ice formed one-half inch thick at Owen, Wyo. On the 16th killing frost occurred at Fort Washakie, Wyo. As compared with the average date of

last killing frost in the respective districts, the frost reported in Idaho and Wyoming on the 13th and 16th, respectively, was about one month late, the frost of the 4th in Utah was three to four weeks late, the frost of the 4th to 9th in Colorado was three to five weeks late, and the frost of the 8th in New York and Michigan, and of the 10th in Arizona, was five to six weeks late. For the current month no frost was reported in New England south of central New Hampshire; in the middle Atlantic states frosts occurred at the more elevated stations as far south as extreme northeastern West Virginia on the 8th; in the central valleys frost was reported in south-central Illinois on the 13th, and in north-central Kansas on the 3d; in the Rocky Mountain and plateau regions frost was reported as far south as east-central Arizona on the 4th to 7th, and 10th; on the Pacific coast frost was reported in the Sacramento Valley in about latitude north 39° on the 1st, 2d, 3d, 18th, and 20th. Compared with the preceding month the southern limit of frost for June, 1890, was about five degrees farther north in the Atlantic coast states, about four degrees farther north in the central valleys, about one degree farther

south in the plateau region, and about five degrees farther north on the Pacific coast.

TEMPERATURE OF WATER.

The following table shows the maximum, minimum, and mean water temperature as observed at the harbors of the several stations; the monthly range of water temperature; and the mean temperature of the air for June, 1890:

| Stations. | Temperature at bottom. | | | | Mean temperature of air at the station. |
|------------------------|------------------------|------|--------|---------------|---|
| | Max. | Min. | Range. | Monthly mean. | |
| Boston, Mass..... | 67.0 | 58.0 | 9.0 | 61.4 | 64.2 |
| Canby, Fort, Wash..... | 63.5 | 56.3 | 7.2 | 60.4 | 55.8 |
| Charleston, S. C..... | 87.0 | 77.8 | 9.2 | 82.8 | 82.2 |
| Eastport, Me..... | 48.0 | 44.8 | 3.2 | 45.9 | 54.0 |
| Galveston, Tex..... | 87.0 | 74.5 | 12.5 | 82.8 | 80.3 |
| Key West, Fla..... | 89.5 | 83.0 | 6.5 | 86.2 | 81.4 |
| Portland, Oregon..... | 63.6 | 57.0 | 6.6 | 60.2 | 61.8 |

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for June, 1890, as determined from the reports of nearly 2,000 stations, is exhibited on chart iii. In the table of miscellaneous meteorological data the total precipitation and the departure from the normal are given for each Signal Service station. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

The heaviest precipitation reported for June, 1890, was 16.53, at Fayette, Iowa, and the monthly precipitation exceeded 10 inches on the west-central coast of Fla., in northern Ill., south-central Ind., northeastern, north-central, and west-central Iowa, southern and central La., southwestern Minn., the adjoining parts of N. Dak. and S. Dak., and in northeastern Wis. In the interior of Cal. south of the Sacramento Valley, and thence eastward over the Colorado and lower Gila valleys, no precipitation was reported, and over the eastern part of the plateau region from southwestern N. Mex. northward to southern Wyo., and thence westward over the middle and the southern part of the northern plateau region to the Pacific coast between the thirty-seventh and fortieth parallels, and from central Tex. northward to south-central Ind. T., the monthly precipitation was less than 0.50.

The precipitation was in excess of the average for the month on the north Pacific coast, within an area extending from the Saskatchewan Valley southeastward over Wis. and northern Ill., in south-central N. Mex. and extreme western Tex., in the lower Mississippi valley, on the west Gulf coast, at New York City, Wood's Holl, Mass., Portland, Me., from Ontario north of the lower lakes southwestward over the middle Ohio valley, at Quebec, Yarmouth, N. S., and in Cape Breton and Prince Edward islands; elsewhere the precipitation was deficient. The greatest excesses in precipitation occurred in adjoining parts of Iowa, Ill., and Wis., and in central N. Dak., where they exceeded 4.00, and the most marked deficiencies were noted over eastern Kans., and thence southwestward over central Ind. T., in extreme western Fla., from the S. C. coast northward to south-central N. C., and at Washington City, where they were more than 4.00. Considered by districts the average percentage of the normal in districts where the precipitation was in excess was about as follows: extreme northwest, 179 per cent.; north Pacific coast, 135 per cent.; west Gulf states, 130 per cent.; New England and the upper Mississippi valley, 102 per cent. In districts where the precipitation was defi-

cient the percentages of the normal were about as follows: south Pacific coast, 9 per cent.; middle Pacific coast and southeastern slope of the Rocky Mountains, 19 per cent.; southern and middle plateau regions, 22 per cent.; south Atlantic states, 45 per cent.; middle-eastern slope of the Rocky Mountains, 59 per cent.; middle Atlantic states, 66 per cent.; east Gulf states and northeastern slope of the Rocky Mountains, 76 per cent.; northern plateau region, 79 per cent.; Key West, Fla., 80 per cent.; Rio Grande Valley, 83 per cent.; upper lake region, 87 per cent.; lower lake region and Ohio Valley and Tennessee, 96 per cent.; and Missouri Valley, 98 per cent.

The table of miscellaneous meteorological data for regular stations of the Signal Service and the table of deviations from the average precipitation for certain stations, as reported by voluntary observers, show that at the following-named places the precipitation for the current month was the heaviest reported for June during the respective periods of observation: Lexington and Louisville, Ky., Vevay, Ind., Monticello, Logan, Dubuque, and Cresco, Iowa, La Crosse, Wis., Fort Sully and Huron, S. Dak., Bismarck, N. Dak., and Port Angeles, Wash. At Charlotte, N. C., Charleston, S. C., Atlanta, Ga., Pensacola, Fla., Lead Hill, Ark., Nashville, Tenn., Cairo, Ill., Denver, Colo., Wellington, Kans., Abilene, Tex., Fort Apache, Fort Verde, Whipple Barracks, and Yuma, Ariz., Keeler, Sacramento, and San Diego, Cal., the precipitation was the least ever reported for June, and at the stations named in Arizona and California, save at Fort Apache, Ariz., and Keeler, Cal., no precipitation was reported, and an entire absence of precipitation in June has been reported for 2 or more preceding years.

In June of preceding years the heaviest precipitation was reported generally in the Rio Grande Valley in 1887; in the extreme northwest and on the north Pacific coast in 1888; on the southeastern slope of the Rocky Mountains in 1878 and 1889; in the middle plateau region in 1885 and 1889; in the northern plateau region and on the middle and south Pacific coasts in 1884 and 1888; and the least precipitation for June was generally reported in New England in 1873 and 1888; in the middle Atlantic states north of Virginia in 1873; in the west Gulf states in 1882; and in the extreme northwest in 1887 and 1889; elsewhere the periods of greatest and least precipitation in June were irregular.

For the period January to June, 1890, inclusive, the precipitation in the west Gulf states, the Ohio Valley and Tennessee, and the lower lake region averaged about one-fourth greater than the normal, while in the south Atlantic states, at Key West, Fla., in the east Gulf states, in the Missouri Valley, on the northeastern and middle-eastern slopes of the Rocky

Mountains, over the middle plateau region, and on the middle Pacific coast it averaged two to three-fourths of the normal amount for the period named.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for June for a series of years; (2) the length of record during which the observations have been taken and from which the average has been computed; (3) the total precipitation for June, 1890; (4) the departure of the current month from the average; (5) and the extreme monthly precipitation for June during the period of observation and the years of occurrence:

| State and station. | County. | (1) Average for the month of June. | (2) Length of record. | (3) Total for June, 1890. | (4) Departure from average. | (5) Extreme monthly precipitation for June. | | | |
|------------------------|----------------------|------------------------------------|-----------------------|---------------------------|-----------------------------|---|-------|---------|-------|
| | | | | | | Greatest. | | Least. | |
| | | | | | | Am't. | Year. | Am't. | Year. |
| Arkansas. | | Inches. | Years. | Inches. | Inches. | Inches. | | Inches. | |
| Lead Hill | Boone | 4.96 | 8 | 2.15 | -2.78 | 7.14 | 1882 | 2.15 | 1890 |
| California. | | | | | | | | | |
| Sacramento | Sacramento | 0.13 | 40 | 0.00 | -0.13 | 1.57 | 1884 | 0.00 | * |
| Connecticut. | | | | | | | | | |
| Middletown | Middlesex | 4.67 | 28 | 2.16 | -2.51 | 8.05 | 1862 | 0.49 | 1873 |
| Florida. | | | | | | | | | |
| Merritt's Island | Brevard | 7.93 | 12 | 5.45 | -2.48 | 14.28 | 1889 | 3.32 | 1878 |
| Georgia. | | | | | | | | | |
| Forsyth | Monroe | 4.65 | 16 | 2.40 | -2.25 | 11.14 | 1886 | 1.45 | 1879 |
| Illinois. | | | | | | | | | |
| Peoria | Peoria | 3.86 | 34 | 2.42 | -1.44 | 11.18 | 1882 | 0.45 | 1863 |
| Riley | McHenry | 4.14 | 39 | 9.64 | +5.50 | 9.68 | 1869 | 0.41 | 1863 |
| Indiana. | | | | | | | | | |
| Logansport | Cass | 4.25 | 17 | 8.38 | +4.13 | 8.99 | 1882 | 0.55 | 1863 |
| Vevay | Switzerland | 4.67 | 24 | 9.50 | +4.83 | 9.50 | 1890 | 1.36 | 1873 |
| Iowa. | | | | | | | | | |
| Cresco | Howard | 4.76 | 17 | 11.71 | +6.95 | 11.71 | 1890 | 2.46 | 1887 |
| Monticello | Jones | 4.37 | 35 | 12.19 | +7.82 | 12.19 | 1890 | 0.74 | 1857 |
| Logan | Harrison | 5.60 | 24 | 14.09 | +8.49 | 14.09 | 1890 | 0.30 | 1870 |
| Kansas. | | | | | | | | | |
| Lawrence | Douglas | 5.05 | 24 | 2.12 | -2.93 | 12.11 | 1876 | 1.30 | 1872 |
| Wellington | Sumner | 4.55 | 11 | 0.48 | -4.07 | 7.71 | 1886 | 0.48 | 1890 |
| Louisiana. | | | | | | | | | |
| Grand Coteau | St. Landry | 5.69 | 7 | ..... | ..... | ..... | ..... | ..... | ..... |
| Maine. | | | | | | | | | |
| Orono | Penobscot | 3.39 | 20 | 3.84 | +0.45 | 5.42 | 1878 | 0.73 | 1880 |
| Maryland. | | | | | | | | | |
| Cumberland | Allegany | 3.39 | 18 | 3.07 | -0.32 | 5.84 | 1880 | 0.86 | 1885 |
| Massachusetts. | | | | | | | | | |
| Amherst | Hampshire | 3.79 | 53 | ..... | ..... | ..... | ..... | ..... | ..... |
| Newburyport | Essex | 2.96 | 12 | 3.43 | +0.47 | 5.94 | 1879 | 1.57 | 1880 |
| Somerset | Bristol | 3.10 | 18 | 4.58 | +1.48 | 7.60 | 1875 | 1.29 | 1886 |
| Michigan. | | | | | | | | | |
| Kalamazoo | Kalamazoo | 4.86 | 14 | 3.77 | -1.09 | 8.10 | 1883 | 1.78 | 1876 |
| Thornville | Lapeer | 3.86 | 13 | 3.39 | -0.47 | 9.14 | 1883 | 1.92 | 1886 |
| Minnesota. | | | | | | | | | |
| Minneapolis | Hennepin | 4.24 | 24 | 5.97 | +1.73 | 9.68 | 1874 | 1.53 | 1889 |
| Montana. | | | | | | | | | |
| Fort Shaw | Lewis & Clarke | 1.88 | 20 | 1.41 | -0.47 | 4.98 | 1879 | 0.20 | 1876 |
| New Hampshire. | | | | | | | | | |
| Hanover | Grafton | 3.47 | 48 | 2.63 | -0.84 | 7.27 | 1838 | 0.73 | 1864 |
| New Jersey. | | | | | | | | | |
| Moorestown | Burlington | 3.84 | 27 | 3.11 | -0.73 | 7.55 | 1867 | 1.01 | 1864 |
| South Orange | Essex | 3.41 | 18 | 5.06 | +1.65 | 6.02 | 1884 | 1.00 | 1885 |
| New York. | | | | | | | | | |
| Coopersburg | Otsego | 4.25 | 36 | 4.89 | +0.64 | 9.76 | 1855 | 0.95 | 1870 |
| Palermo | Oswego | 3.35 | 36 | 2.60 | -0.75 | 8.80 | 1865 | 0.70 | 1870 |
| North Carolina. | | | | | | | | | |
| Lenoir | Caldwell | 4.25 | 18 | 2.80 | -1.45 | 10.30 | 1884 | 0.90 | 1881 |
| Ohio. | | | | | | | | | |
| N. Lewisburgh | Champaign | 3.92 | 18 | 1.85 | -2.07 | 10.60 | 1877 | 1.05 | 1886 |
| Wauseon | Fulton | 4.17 | 18 | 3.88 | -0.29 | 8.53 | 1881 | 1.43 | 1872 |
| Oregon. | | | | | | | | | |
| Albany | Linn | 1.58 | 11 | 1.41 | -0.17 | 5.31 | 1888 | 0.22 | 1883 |
| Eola | Polk | 1.33 | 19 | 1.18 | -0.15 | 5.06 | 1888 | 0.05 | 1883 |
| Pennsylvania. | | | | | | | | | |
| Dyberry | Wayne | 2.90 | 19 | 4.24 | +1.34 | 5.38 | 1883 | 1.13 | 1873 |
| Grampian Hills | Clearfield | 4.34 | 18 | 2.74 | -1.60 | 9.85 | 1884 | 1.31 | 1867 |
| Wellsborough | Tioga | 7.24 | 11 | 5.14 | -2.10 | 17.47 | 1881 | 2.01 | 1886 |
| South Carolina. | | | | | | | | | |
| Statesburgh | Sumter | 3.47 | 9 | 2.65 | -0.82 | 5.35 | 1886 | 1.38 | 1881 |
| Tennessee. | | | | | | | | | |
| Austin | Wilson | 5.18 | 20 | 4.68 | -0.50 | 8.92 | 1878 | 0.66 | 1874 |
| Texas. | | | | | | | | | |
| New Ulm | Austin | 4.06 | 16 | 4.87 | +0.81 | 11.33 | 1873 | 0.51 | 1885 |
| Vermont. | | | | | | | | | |
| Stratford | Orange | 3.41 | 17 | 2.90 | -0.51 | 6.30 | 1876 | 1.60 | 1874 |
| Virginia. | | | | | | | | | |
| Birdsnest | Northampton | 3.38 | 21 | 2.15 | -1.23 | 8.15 | 1881 | 1.00 | 1882 |
| Wisconsin. | | | | | | | | | |
| Madison | Dane | 4.19 | 20 | 7.72 | +3.53 | 9.31 | 1880 | 1.06 | 1886 |
| Washington. | | | | | | | | | |
| Fort Townsend | Jefferson | 1.48 | 15 | 1.59 | +0.11 | 4.10 | 1875 | 0.24 | 1886 |

* Generally. † 1864 and 1870. ‡ 1884 and 1885. § Not received.

EXCESSIVE PRECIPITATION.

Monthly precipitation to equal or exceed 10 was reported at 9 stations in Iowa; at 4 stations in La. and Wis.; at 3 stations

in Ill.; at 2 stations in Ind. and Minn.; and at 1 station in N. Dak., S. Dak., and Fla.; the heaviest precipitation, 16.53, being reported at Fayette, Iowa.

In June of preceding years monthly precipitation to equal or exceed 10 has been reported for 25 years in Fla.; for 17 years in Mo.; for 16 years in Iowa and N. Y.; for 15 years in Tex.; for 14 years in Kans.; for 13 years in La.; for 12 years in Ill.; for 11 years in Ohio; for 5 to 10 years, inclusive, in Ala., the Dakotas, Ga., Ind., Mich., Minn., Nebr., N. H., N. C., Pa., S. C., Tenn., and Va.; and for 1 to 4 years, inclusive, in Ark., Colo., Conn., Ind. T., Md., Mass., Miss., N. J., R. I., Vt., Wash., and Wis. In states and territories other than those named precipitation to equal or exceed 10 has not been reported for June of preceding years. The following are notably heavy rainfalls reported for June of preceding years: 36.91, at Alexandria, La., in 1886; 29.56, at Fort Pike, La., in 1843; 29.35, at Fort Pierce, Fla., in 1853; 28.86, at Fernandina, Fla., in 1864; 26.59, at Cheneyville, La., in 1886; 25.58, at Fort Myers, Fla., in 1853; 24.56, at Fort Scott, Kans., in 1845; 21.86, at Sylvan Park, Minn., in 1872; and 20.15, at Sing Sing, N. Y., in 1867. In June, 1889, a monthly rainfall of 44.36 was reported at the Island of Dominica, W. I., and at Colon, U. S. of Colombia, a depth of 31.26 was noted.

Precipitation to equal or exceed 2.50 in twenty-four hours was reported at 22 stations in Tex., and on 3 dates, the 6th, 7th, and 8th; at 18 stations in Iowa, and on 9 dates, the 2d to 4th, 10th, 17th, 19th, 20th, 23d, and 24th; at 13 stations in La., and on 8 dates, the 1st, 6th, 8th, 10th, 22d to 24th, and 27th; at 8 stations in Ill., and on 5 dates, the 11th to 14th, and 20th; at 7 stations in Minn., and on 7 dates, the 4th, 5th, 14th, 19th, 20th, 23d, and 29th; at 6 stations in Kans., and on 4 dates, the 17th to 20th; at 6 stations in Ohio, and on 3 dates, the 14th, 20th, and 21st; at 5 stations in Ind., and on 4 dates, the 11th, 14th, 18th, and 29th; at 5 stations in Pa., and on 2 dates, the 6th and 12th; at 5 stations in S. Dak., and on 5 dates, the 3d to 5th, 16th and 17th; at 4 stations in Ark., and on 5 dates, the 4th, 5th, 8th, 27th, and 28th; at 4 stations in Miss., and on 3 dates, the 8th, 9th, and 22d; at 4 stations in Mo., and on 3 dates, the 14th, 19th, and 20th; at 4 stations in Tenn., and on 2 dates, the 9th and 25th; at 4 stations in Wis., and on 5 dates, the 2d, 13th, 14th, 20th, and 29th; at three stations in Fla., and on 4 dates, the 2d, 21st, 22d, and 30th; at 3 stations in Ga., and on 3 dates, the 2d, 21st, and 24th; at 3 stations in W. Va., and on 2 dates, the 21st and 22d; at 2 stations in Idaho, and on 2 dates, the 1st and 3d; at 2 stations in Ky., and on 3 dates the 9th, 10th, and 11th; at 2 stations in Mass., and on 3 dates, the 11th to 13th; at 2 stations in Nebr. on the 3d; at 2 stations in N. Dak., and on 4 dates, the 19th, 20th, 29th, and 30th; at one station in Ala., on the 8th; at one station in Mich., on the 20th; at one station in N. Y., on the 5th; and at one station in N. C., on the 4th. Among the heavier rainfalls reported for this period were: 5.00, at Marengo, Ind., on the 18th; 8.00, at Cunningham, Kans., on the 19-20th; 5.75, at Kingman, Kans., on the 19th; 5.85, at Edgard, La., on the 23d; 6.00, at Columbia, Tex., on the 7-8th; and 5.07, at Cadiz, Wis., on the 13-14th.

In June of preceding years precipitation to equal or exceed 2.50 in 24 hours has been reported most frequently in Mo., where it has been noted for 22 years; in Tex. for 17 years; in Fla. and Kans. for 16 years; in Ill. for 15 years; in the Dakotas for 14 years; in Iowa for 13 years; in N. Y. and Ohio for 12 years; in Ga., Minn., Nebr., and S. C. for 11 years; in Ala., Ark., Conn., Ind., Ind. T., La., Md., Mass., Mich., Miss., N. J., N. C., Pa., Tenn., and Va. for 5 to 10 years, inclusive; and in Colo., Del., Ky., Me., Mont., N. H., N. Mex., R. I., Vt., and Wis. for 1 to 4 years, inclusive. In states and territories other than those named precipitation to equal or exceed 2.50 in 24 hours has not been reported in June of preceding years.

Among the heavier rainfalls reported for 24 hours in June of preceding years were: 22.27, at Alexandria, La., 16th, 1886; 10.70, at Pensacola, Fla., 29th, 1887; 10.24, at Fort Griffin, Tex., 21st, 1879; 9.70, at Sour Lake, Tex., 18th, 1888; 8.75,

at Clear Creek, Nebr., 1st, 1875; 7.50, at Nashua, Iowa, 14th, 1880; 7.40, at Little Rock, Ark., 28th, 1879; 7.39, at Salisbury, N. C., 10th, 1883; 7.03, at Wilmington, N. C., 30th, 1876; 7.00, at Fort McPherson, Nebr., 25th, 1868, and Columbia, Tex., 17th, 1888; 5.90, at Cheneyville, La., 10th, 1889; 5.27, at Merritt's Island, Fla., 23d, 1880. At Colon, United States of Colombia, 6.30 was reported on the 16th, 1889.

Precipitation to equal or exceed 1.00 in one hour was reported at 8 stations in La., and on 7 dates, the 10th, 14th, 18th, 19th, 20th, 22d, and 27th; at 7 stations in Pa., and on 6 dates, the 11th, 15th, 17th, and 21st to 23d; at 5 stations in Mich., and on 3 dates, the 5th, 17th, and 30th; at 4 stations in Ind., and on 4 dates, the 12th, 15th, 16th, and 21st; at 4 stations in Nebr., and on 3 dates, the 2d, 22d, and 28th; at 4 stations in Ohio, and on 3 dates, the 15th, 24th, and 28th; at 4 stations in Tenn., and on 4 dates, the 10th, 16th, 25th, and 28th; at 3 stations in Ga., and on 5 dates, the 16th, 19th, 25th, 26th, and 30th; at 3 stations in Ill., and on 4 dates, the 10th, 14th, 22d, and 30th; at 3 stations in Miss., and on 3 dates, the 17th, 18th, and 22d; at 3 stations in Mo., and on 3 dates, the 10th, 20th, and 23d; at 3 stations in Wis., and on 4 dates, the 2d, 14th, 23d, and 28th; at 2 stations in Ala., and on 2 dates, the 9th and 11th; at 2 stations in Colo., and on 2 dates, the 15th and 24th; at 2 stations in Fla., and on 2 dates, the 3d and 24th; at 2 stations in Kans., and on 2 dates, the 28th and 30th; at 2 stations in Minn., and on 3 dates, the 13th, 18th, and 23d; at 2 stations in N. Y., and on 2 dates, the 5th and 6th; at 2 stations in N. C., and on 2 dates, the 4th and 24th; at 2 stations in N. Dak., and on 2 dates, the 17th and 20th; at 2 stations in Va., and on 2 dates, the 18th and 22d; at one station in Ark., on the 27th; at one station in Idaho, on the 19th; at one station in Iowa, on the 1st; at one station in Ky., on the 15th; at one station in N. Dak., on the 1st; and at one station in Tex., on the 6th and 7th. Among the heavier rainfalls reported for one hour or less were: 1.28 in 15 minutes, at Conception, Mo., on the 10th; 1.00 in 15 minutes, at Potosi, Wis., on the 2d; 1.70 in 20 minutes, at Allapaha, Ga., on the 26th; 1.50 in 20 minutes, at Potosi, Wis., on the 14th; and 2.07 in 25 minutes, at Sheldon, Minn., on the 23d.

In June of preceding years precipitation to equal or exceed 1.00 in one hour has been reported for 19 years in Kans.; for 14 years in Ga., Mo., and Tex.; for 12 years in Ill., Iowa, and Nebr.; for 11 years in Fla. and Mich.; for 5 to 10 years, inclusive, in the Dakotas, Ind., La., Minn., N. C., Ohio, Pa., S. C., Tenn., and Va.; and for 1 to 4 years, inclusive, in Ala., Ariz., Ark., Colo., Conn., Ind. T., Ky., Me., Md., Mass., Miss., Mont., N. H., N. J., N. Mex., N. Y., W. Va., Wis., and Wyo. Among the heavier rainfalls reported for this period in June of preceding years were: 0.30 in 3 minutes, 5th, 1885; 0.44 in 5 minutes, 6th, 1883, and 0.50 in 10 minutes, 29th, 1882, at New York City; 0.37 in five minutes, at Augusta, Ga., 27th, 1888; 1.19 in 13 minutes, at Anna, Ill., 20th, 1878. For 15-minute periods, 1.45 at Southington, Conn., 29th, 1879; 1.56 at Fort Randall, S. Dak., 28th, 1873; 1.75 at Portsmouth, Ohio, 22d, 1851, and 2.02 at Erie, Pa., 17th, 1886. For 30-minute periods, 2.02 at Denmark, Iowa, 25th, 1879; 2.00 at Boston, Mass., 29th, 1879; 2.00 at Alpena, Mich., 24th, 1880; 2.00 at Galveston, Tex., 17th, 1888, and 2.00 at Keswick, Va., 3d, 1881; 1.75 in 20 minutes at Clarinda, Iowa, 20th, 1889; 3.03 in 35 minutes at Clear Creek, Nebr., 25th, 1882; and 3.24 in 45 minutes, at Dodge City, Kans., 19th, 1888.

Table of excessive precipitation, June, 1890.

| State and station. | Monthly rainfall to inches, or more. | Rainfall 2.50 inches, or more, in 24 hours. | | Rainfall of 1 inch or more, in one hour. | | |
|-----------------------|---|--|------|--|--------------|------|
| | | Amt. | Day. | Amt. | Time. | Day. |
| <i>Alabama.</i> | <i>Inches.</i> | <i>Inches.</i> | | <i>Inches.</i> | <i>h. m.</i> | |
| Livingston (1) | 1.59 | | | 1.59 | 1 30 | 11 |
| Montgomery | 1.24 | | | 1.24 | 1 00 | 9 |
| Mount Vernon Barracks | 2.53 | | 8 | | | |

Table of excessive precipitation—Continued.

| State and station. | Monthly rainfall to inches, or more. | Rainfall 2.50 inches, or more, in 24 hours. | | Rainfall of 1 inch, or more, in one hour. | | |
|----------------------|---|--|-------|---|--------------|------|
| | | Amt. | Day. | Amt. | Time. | Day. |
| <i>Arkansas.</i> | <i>Inches.</i> | <i>Inches.</i> | | <i>Inches.</i> | <i>h. m.</i> | |
| Hot Springs | 3.77 | | 4-5 | | | |
| Do | 2.62 | | 27 | 2.62 | 2 00 | 27 |
| Little Rock | 3.41 | | 27-28 | | | |
| Little Rock Barracks | 3.35 | | 27 | | | |
| Winslow | 4.30 | | 8 | | | |
| <i>Colorado.</i> | | | | | | |
| Crook | | | | 1.20 | 1 00 | 24 |
| First View | | | | 1.05 | 0 50 | 15 |
| <i>Florida.</i> | | | | | | |
| Fort Barrancas | 4.06 | | 21-22 | | | |
| Lake City | | | | 1.08 | 0 30 | 24 |
| Madison | 2.61 | | 30 | | | |
| Manatee | 3.06 | | 2 | | | |
| Tampa | 11.58 | | | 1.96 | 0 55 | 3 |
| <i>Georgia.</i> | | | | | | |
| Allapaha | | | | 1.00 | 0 35 | 16 |
| Do | | | | 1.70 | 0 20 | 26 |
| Athens (2) | 3.27 | | 21 | | | |
| Augusta | | | | 1.42 | 0 50 | 19 |
| Do | | | | 1.50 | 1 10 | 30 |
| Camak | 3.00 | | 2 | | | |
| Diamond | 3.50 | | 24 | | | |
| Monticello | | | | 1.56 | 0 45 | 16 |
| Do | | | | 1.06 | 1 10 | 25 |
| <i>Idaho.</i> | | | | | | |
| Henry's Lake | 3.00 | | 3 | 1.20 | 0 45 | 19 |
| Mullan | 3.82 | | 1 | | | |
| <i>Illinois.</i> | | | | | | |
| Aurora (1) | 2.96 | | 13-14 | | | |
| Aurora (2) | 2.62 | | 14 | | | |
| Charleston | 3.24 | | 11 | 1.28 | 1 08 | 30 |
| Cockrell | 13.57 | | | 1.00 | 1 00 | 10 |
| Do | | | | 1.10 | 1 00 | 14 |
| Dwight | 3.50 | | 12-13 | | | |
| Lanark | 12.32 | | 20 | | | |
| Pana | 2.50 | | 11 | 1.00 | 0 50 | 22 |
| Sandwich | 2.89 | | 13-14 | | | |
| Winnabago | 10.15 | | 13-14 | | | |
| <i>Indiana.</i> | | | | | | |
| Butler | | | | 1.47 | 1 00 | 15 |
| Crawfordsville | 3.00 | | 18 | | | |
| Huntingburgh | 10.89 | | 11 | | | |
| Indianapolis | | | | 1.04 | 0 25 | 12 |
| La Fayette | 2.61 | | 29 | | | |
| Logansport (1) | 4.00 | | 14 | 1.15 | 1 00 | 21 |
| Marengo | 10.50 | | 18 | | | |
| Vevay | | | | 1.25 | 0 50 | 16 |
| <i>Iowa.</i> | | | | | | |
| Belle Plaine | 2.50 | | 19-20 | | | |
| Carson | 3.75 | | 21-22 | | | |
| Cedar Rapids | 3.18 | | 14-15 | | | |
| Clarinda | | | | 1.25 | 1 00 | 1 |
| Cresco | 11.71 | | | | | |
| Dubuque | 3.04 | | 2-3 | | | |
| Eagle Grove | 11.95 | | 4 | | | |
| Do | 4.25 | | 19 | | | |
| Fayette | 16.53 | | 5-6 | | | |
| Do | 3.05 | | 23-24 | | | |
| Fort Madison | 3.20 | | 17 | | | |
| Hampton | 4.02 | | 3-4 | | | |
| Do | 3.44 | | 19-20 | | | |
| Humboldt | 2.62 | | 19 | | | |
| Irwin | 10.48 | | 2-3 | | | |
| Logan | 14.09 | | 2 | | | |
| Manson | 2.93 | | 4 | | | |
| Do | 2.73 | | 19 | | | |
| Maquoketa | 10.98 | | 3 | | | |
| Monticello | 12.19 | | 2-3 | | | |
| Mount Vernon | 12.50 | | | | | |
| Muscataine (1) | 3.80 | | 10 | | | |
| Muscataine (2) | 2.83 | | 10 | | | |
| Osage | 2.92 | | 20 | | | |
| Sac City | 2.70 | | 3-4 | | | |
| Webster City | 2.50 | | 4 | | | |
| Do | 2.75 | | 19 | | | |
| <i>Kansas.</i> | | | | | | |
| Alton | | | | 2.45 | 2 00 | 28 |
| Coldwater | 2.50 | | 18 | | | |
| Cunningham | 8.00 | | 19-20 | | | |
| Halstead | 3.58 | | 19 | | | |
| Kingman | 5.75 | | 19 | | | |
| Rome | | | | 1.13 | 1 00 | 30 |
| Sedan | 2.90 | | 17 | | | |
| Wichita | 2.50 | | 17 | | | |
| <i>Kentucky.</i> | | | | | | |
| Caddo | 3.00 | | 11-12 | | | |
| Louisville | | | | 1.22 | 1 00 | 15 |
| Princeton | 3.90 | | 9 | | | |
| <i>Louisiana.</i> | | | | | | |
| Cameron | 3.70 | | 6 | | | |
| Columbia | 3.00 | | 1 | | | |
| Do | 3.00 | | 24 | | | |
| Crowley | 2.90 | | 27 | | | |
| Edgard | 5.85 | | 23 | | | |
| Emilie | 11.33 | | 22-23 | 1.00 | 0 40 | 30 |
| Houma | 13.13 | | | 1.04 | 0 28 | 19 |
| Jackson Barracks | 11.50 | | | | | |
| Do | 3.85 | | 1 | | | |
| Jeanerette | 2.80 | | 6 | | | |
| Liberty Hill | 3.67 | | 10 | 3.67 | 3 00 | 10 |
| Maurepas | 2.75 | | 8 | 1.28 | 0 35 | 18 |
| Do | 4.75 | | 23 | 1.50 | 1 30 | 27 |

Table of excessive precipitation—Continued.

| State and station. | Monthly rainfall to inches, or more. | Rainfall 2.50 inches, or more, in 24 hours. | | Rainfall of 1 inch, or more, in one hour. | | |
|----------------------|--------------------------------------|---|-------|---|-------|------|
| | | Amt. | Day. | Amt. | Time. | Day. |
| Louisiana—Continued. | | | | | | |
| Markaville | Inches. | Inches. | | Inches | h. m. | |
| Do. | | | | 1.15 | 0 45 | 10 |
| Monroe | 11.90 | 5.01 | 5-6 | 1.20 | 1 05 | 18 |
| Natchitoches | | 2.50 | 10 | | | |
| New Iberia | | | | 1.25 | 0 55 | 14 |
| New Orleans | | 3.08 | 22-23 | 1.25 | 0 30 | 21 |
| Port Eads | | 3.00 | 22 | | | |
| Do. | | 2.90 | 23 | | | |
| Massachusetts. | | | | | | |
| Brewster | | 3.15 | 11-12 | | | |
| Wood's Holl | | 3.42 | 12-13 | | | |
| Michigan. | | | | | | |
| Fitchburgh | | | | 1.15 | 1 00 | 30 |
| Gulliver Lake | | | | 2.00 | 1 10 | 30 |
| Mottville | | 2.73 | 20 | | | |
| Sault de Ste. Marie | | | | 1.75 | 1 00 | 5 |
| Stanton | | | | 1.68 | 0 55 | 30 |
| Williamston | | | | 2.60 | 2 00 | 17 |
| Minnesota. | | | | | | |
| Alexandria | | 4.00 | 20 | | | |
| Medford | | 2.71 | 4 | | | |
| Do. | | 2.80 | 23 | | | |
| Montevideo | | 2.78 | 4-5 | | | |
| Moorhead | | | | 1.15 | 0 25 | 13 |
| Pokegama Falls | | 2.66 | 14 | | | |
| Do. | | 3.60 | 29 | | | |
| Redwood Falls | 13.95 | 3.88 | 5 | | | |
| Do. | | 3.74 | 21 | | | |
| Saint Charles | 12.00 | 3.20 | 19-20 | | | |
| Do. | | 3.22 | 23 | | | |
| Sheldon | | 3.14 | 23 | 1.35 | 0 22 | 18 |
| Do. | | | | 2.07 | 0 25 | 23 |
| Mississippi. | | | | | | |
| Aberdeen | | 2.75 | 9 | | | |
| Agricultural College | | | | 1.10 | 1 00 | 22 |
| Hernando | | 2.50 | 9 | | | |
| Louisville | | | | 1.16 | 1 00 | 17 |
| Moss Point | | 3.40 | 22 | | | |
| Pearlington | | | | 1.03 | 1 00 | 18 |
| Rienzi | | 2.63 | 8 | | | |
| Missouri. | | | | | | |
| Adrian | | 3.10 | 14 | | | |
| Conception | | | | 1.28 | 0 15 | 10 |
| Excelsior | | 2.70 | 19-20 | | | |
| Grand Pass | | | | 1.00 | 1 00 | 20 |
| Princeton | | | | 2.15 | 1 30 | 23 |
| Saint Joseph | | 4.33 | 19-20 | | | |
| Sarcozie | | 2.50 | 14 | | | |
| Nebraska. | | | | | | |
| Alliance | | | | 1.30 | 0 25 | 28 |
| Fremont | | | | 1.53 | 1 20 | 2 |
| Kennedy | | | | 1.09 | 1 20 | 2 |
| Omaha | | | | 1.10 | 1 05 | 22 |
| Plattsmouth | | 2.50 | 3 | | | |
| Weeping Water | | 2.50 | 3 | | | |
| New York. | | | | | | |
| Davids Island | | | | 1.35 | 1 15 | 6 |
| Pendleton Centre | | 2.75 | 5 | | | |
| Watervliet Arsenal | | | | 1.10 | 0 50 | 5 |
| North Carolina. | | | | | | |
| New Berne | | | | 1.20 | 1 00 | 24 |
| Washington | | 4.03 | 4 | 4.03 | 2 00 | 4 |
| North Dakota. | | | | | | |
| Bismarck | | | | 1.00 | 0 35 | 1 |
| Fort Abraham Lincoln | 10.93 | | | | | |
| Fort Buford | | 3.50 | 19-20 | | | |
| Fort Pembina | | 2.74 | 29-30 | | | |
| Ohio. | | | | | | |
| Bellevue | | | | 1.40 | 0 45 | 28 |
| Bucyrus | | 3.15 | 21 | | | |
| Cincinnati | | | | 1.36 | 1 00 | 15 |
| Demos | | 2.82 | 21 | | | |
| Gratiot | | | | 1.28 | 1 15 | 24 |
| Jacksonborough | | 2.90 | 14 | 1.40 | 0 40 | 15 |
| Napoleon | | 3.60 | 20-21 | | | |
| New Comerstown | | 2.70 | 21 | | | |
| Upper Sandusky | | 3.75 | 21 | | | |
| Pennsylvania. | | | | | | |
| Blue Knob | | | | 1.60 | 1 20 | 17 |
| Doylestown | | 3.78 | 12 | | | |
| Emporium | | | | 1.10 | 0 50 | 22 |
| Forks of Neshaminy | | 3.99 | 12 | | | |
| Greenville | | | | 1.68 | 1 15 | 11 |
| Mauch Chunk | | 2.71 | 12 | | | |
| Oil City | | 3.01 | 12 | | | |
| Pittsburgh | | | | 1.15 | 0 35 | 15 |
| Pleasant Mount | | | | 1.15 | 0 30 | 21 |
| Somerset | | | | 1.13 | 1 00 | 13 |
| Wellsborough | | 2.60 | 6 | | | |
| York | | | | 1.00 | 1 00 | 23 |
| South Dakota. | | | | | | |
| Aberdeen | | 3.35 | 16-17 | | | |
| Fort Meade | | 3.80 | 4-5 | | | |
| Fort Sully | | 3.78 | 3-4 | | | |
| Highmore | | 2.50 | 17 | 2.50 | 1 30 | 17 |
| Do. | | | | 1.20 | 0 40 | 20 |
| Millbank | 10.53 | 4.40 | 3-4 | | | |
| Tennessee. | | | | | | |
| Arlington | | 2.50 | 9 | | | |
| Chattanooga | | | | 1.56 | 1 00 | 28 |
| Dunlap | | 3.09 | 25 | 3.09 | 1 30 | 25 |

Table of excessive precipitation—Continued.

| State and station. | Monthly rainfall to inches, or more. | Rainfall 2.50 inches, or more, in 24 hours. | | Rainfall of 1 inch, or more, in one hour. | | |
|----------------------|---|--|---------|---|-------|------|
| | | Amt. | Day. | Amt. | Time. | Day. |
| Tennessee—Continued. | | Inches. | Inches. | Inches | A. m. | |
| Lewisburgh | | | | 1.02 | 1 00 | 10 |
| Milan (2) | | 2.50 | 9 | | | |
| Trenton | | 2.67 | 9 | 1.10 | 0 30 | 16 |
| Texas. | | | | | | |
| Austin (1) | | 3.60 | 7 | | | |
| Brasoria | | 3.60 | 7 | | | |
| Do | | 3.07 | 8 | | | |
| Brenham | | 3.09 | 8 | | | |
| Burnet | | 3.93 | 7 | | | |
| Camp Eagle Pass | | 3.05 | 6 | | | |
| Columbia | | 6.00 | 7-8 | | | |
| Corpus Christi | | 2.50 | 6-7 | | | |
| Cuero | | 3.94 | 8 | | | |
| Duval | | 3.60 | 7 | | | |
| Fort Brown | | 2.50 | 7 | | | |
| Fredericksburgh | | 2.57 | 7 | | | |
| Gallinas | | 3.05 | 7 | | | |
| Galveston | | 3.49 | 6 | 1.80 | 1 00 | 7 |
| Do | | | | 2.55 | 1 00 | 6 |
| Houston | | 4.36 | 8 | | | |
| Huntsville | | 4.36 | 8 | | | |
| La Grange | | 2.55 | 7-8 | | | |
| Lampasas | | 2.51 | 7 | | | |
| New Ulm | | 3.11 | 8 | | | |
| Palestine | | 3.15 | 7-8 | | | |
| Round Rock | | 2.83 | 7 | | | |
| San Antonio | | 3.13 | 7-8 | | | |
| Santa Maria | | 2.63 | 7 | | | |
| Virginia. | | | | | | |
| Alexandria | | | | 1.14 | 1 00 | 22 |
| Norfolk | | | | 1.00 | 0 38? | 18 |
| West Virginia. | | | | | | |
| Ella | | 2.62 | 21 | | | |
| Morgantown | | 3.02 | 22 | | | |
| Weston | | 4.00 | 22 | | | |
| Wisconsin. | | | | | | |
| Cadis | | 10.96 | 4.09 | 2 | | |
| Do | | | 5.07 | 13-14 | | |
| Grantsburgh | | 10.76 | 3.00 | 14 | 3.00 | 2 30 |
| Do | | | | | 2.00 | 1 00 |
| La Crosse | | | | | 1.30 | 0 35 |
| Oshkosh | | 2.50 | 20 | | | |
| Potosi | | 10.40 | | | 1.00 | 0 15 |
| Do | | | | | 1.50 | 0 20 |
| Summit Lake | | 10.00 | 4.00 | 29 | | |

Received too late for publication in May Review.

| | | | | | | |
|---------------|--|------|-----|------|------|---|
| Texas. | | | | | | |
| Austin (1) | | | | 1.33 | 1 00 | 2 |
| Corsicana (1) | | 4.50 | 1-2 | | | |

MAXIMUM RAINFALLS IN ONE HOUR OR LESS.

The following table is a record of the heaviest rainfalls during June, 1890, for periods of five and ten minutes and one hour, as reported by regular stations of the Signal Service furnished with self-registering gauges:

| Station. | Maximum fall in— | | | | | |
|---------------------|------------------|-------|---------|-------|---------|-------|
| | 5 min. | Date. | 10 min. | Date. | 1 hour. | Date. |
| | Inch. | | Inch. | | Inch. | |
| Bismarck, N. Dak. | 0.40 | 19 | 0.61 | 19 | 0.95 | 1 |
| Boston, Mass. | 0.06 | 13 | 0.15 | 13 | 0.40 | 13 |
| Buffalo, N. Y. | 0.20 | 3 | 0.30 | 3 | 0.65 | 3 |
| Cincinnati, Ohio | 0.20 | 16 | 0.30 | 16 | 0.50 | 16 |
| Chicago, Ill. | 0.12 | 3 | 0.15 | 3 | 0.35 | 11 |
| Cleveland, Ohio | 0.30 | 10 | 0.55 | 10 | 0.93 | 12 |
| Denver, Colo. | | | | | | |
| Detroit, Mich. | 0.28 | 28 | 0.40 | 28 | 0.65 | 28 |
| Dodge City, Kans. | 0.10 | 8, 19 | 0.15 | 8, 19 | 0.25 | 8, 19 |
| Duluth, Minn. | 0.10 | 26 | 0.17 | 26 | 0.44 | 4 |
| Galveston, Tex. | 0.35 | 7 | 0.70 | 7 | 2.55 | 6 |
| Jupiter, Fla. | 0.25 | 3 | 0.40 | 3 | 0.85 | 3 |
| Marquette, Mich. | 0.25 | 27 | 0.40 | 27 | 0.55 | 27 |
| New York City | 0.35 | 6 | 0.55 | 6 | 0.70 | 6 |
| New Orleans, La. | 0.35 | 22 | 0.70 | 22 | 1.25 | 22 |
| Norfolk, Va. | 0.30 | 18 | 0.60 | 18 | 1.00 | 18 |
| Philadelphia, Pa. | 0.15 | 13 | 0.20 | 12 | 0.36 | 12 |
| Savannah, Ga. | 0.35 | 11 | 0.55 | 11 | 0.90 | 11 |
| Santa Fe, N. Mex. | | | | | | |
| San Francisco, Cal. | | | | | | |
| Saint Louis, Mo. | 0.25 | 17 | 0.35 | 17 | 0.66 | 15 |
| Saint Paul, Minn. | 0.26 | 23 | 0.26 | 23 | 0.66 | 16 |
| Washington City | 0.25 | 12 | 0.45 | 22 | 0.50 | 22 |

* Not sufficient to register.

HAIL.

Description of the more severe hail storms of the month is

given under "Local storms." Hail was reported as follows: 1st, Ga., Idaho, Nebr., Nev., Ohio, Oregon, S. C., S. Dak., Va. 2d, Iowa, Mich., Mo., Nebr., Tenn. 3d, Colo., Idaho, Ill., Iowa, Ky., Mich., Minn., Nebr., Nev., N. Y., Ohio, Pa., S. Dak., Tex., W. Va., Wyo. 4th, Iowa, Kans., Mich., Minn., Nebr., N. Y., N. C., Pa., S. Dak., Wis., Wyo. 5th, Ind. T., Iowa, Mich., Mo., N. Y., Ohio, Penn. 6th, Colo., Mich., N. J., N. Y. 7th, La., Tex. 9th, Idaho. 10th, Kans., Pa., Va., Wyo. 11th, Ala., Conn., Ga., Ill., Ind., Iowa, Mo., Mont., N. J., N. Y., Ohio, Pa., S. C., S. Dak., Tex. 12th, Ill., Md., Miss., Pa. 13th, Ill., Ind., Iowa, Kans., Ky., Minn., N. C., S. Dak., Tenn., W. Va., Wis. 14th, Idaho, Ill., Ind., Iowa, Kans., Mo., Nebr. 15th, Colo., Ga., Ind., Iowa, Kans., Nebr., N. Dak., Tenn., Va. 16th, Ark., Colo., Kans., La., Mo., N. J., N. Y., Tenn., Wash. 17th, Colo., Ill., Mich., N. Mex., N. Y., Oregon, Pa., S. C., S. Dak., Wash. 18th, Colo., Idaho, Ind., Iowa, La., Minn., Mo., N. Dak., S. Dak., Wis. 19th, Idaho, Kans., Minn., Mont. 20th, Ind., Minn., Nebr., S. Dak. 21st, Ala., Iowa, Minn., S. Dak., Tenn.,

Va. 22d, Ill., Iowa, Nebr., N. C., Ohio, Pa. 23d, Minn., Nebr., N. C., Pa., Vt., Va. 24th, Cal., Mont. 25th, Idaho, N. Dak., S. Dak. 26th, Mass. 27th, Idaho, Mich., Nebr., N. Dak., Tenn., Tex. 28th, Cal., Colo., Iowa, Mich., Nebr., N. Y., Ohio, S. Dak., Tenn. 29th, Minn., Miss., N. C., N. Dak., Ohio, S. Dak., Tenn. 30th, Minn., Miss.

SLEET.

Sleet was reported as follows: 4th, Colo. 5th, Pa. 6th, Colo., N. Y. 7th, Colo. 12th, N. Y.

SNOW (snowfall in inches and tenths).

The heaviest monthly snowfall was reported at elevated stations in central Colorado, where a maximum depth of 4.8 fell at La Veta; 3, at Stamford; 2.50, at Breckenridge; and trace, at Box Elder, Colo. In Nevada 3 fell at Ruby Hill, in the east-central part, and 1, at Tuscarora, in the north-central part of the state, and a trace was reported at West Milan, N. H., Cheyenne and Fort Bridger, Wyo.

WINDS.

The prevailing winds during June, 1890, are shown on chart ii by arrows flying with the wind. In New England, the lower lake region, on the northeastern slope of the Rocky Mountains, over the northern plateau region, and along the middle Pacific coast the winds were mostly from northwest to southwest; in the middle Atlantic states, on the middle-eastern slope of the Rocky Mountains, over the southern plateau region, and along the north Pacific coast, from south to west; in the south Atlantic states, from the southwest; over the Florida Peninsula, and in the extreme northwest, from east to southeast; in the west Gulf states, and in the Missouri Valley, from south to southeast; in the Rio Grande Valley, from the southeast; in the Ohio Valley and Tennessee, and along the south Pacific coast, from west to southwest; in the upper Mississippi valley, from southeast to southwest; on the southeastern slope of the Rocky Mountains, from south to southwest; over the middle plateau region from west to northwest; and in the east Gulf states, and the upper lake region, variable.

HIGH WINDS (in miles per hour).

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Signal Service as follows: 1st, 50, n., at Fort Sully, S. Dak.; 50, sw., at Rapid City, S. Dak. 2d, 50, n., at Valentine, Nebr.; 60, n., at Huron, S. Dak. 4th, 50, nw., at Valentine, Nebr.; 66, w., at Fort Sully, S. Dak. 5th, 50, sw., at Memphis, Tenn.; 53, sw., at Chicago, Ill.; 54, sw., at Davenport, Iowa. 6th, 54, ne., at Galveston, Tex. 9th, 76, nw., at Fort Assiniboine, Mont. 10th, 54, sw., at Fort Elliott, Tex. 11th, 50, sw., at Fort Assiniboine, Mont. 13th, 52, se., at Bismarek, N. Dak.; 54, w., at Fort Assiniboine, Mont. 17th, 60, nw., at Detroit, Mich. 21st, 50, w., at Fort Assiniboine, Mont. 22d, 60, se., at Yankton, S. Dak. 23d, 70, se., at Yankton, S. Dak. 26th, 52, s., at Cheyenne, Wyo. 27th, 56, nw., at Fort Buford, N. Dak.; 52, nw., at Valentine, Nebr. 29th, 50, ne., at Chicago, Ill.; 60, n., at Lexington, Ky. 30th, 52, nw., at Columbus, Ohio.

LOCAL STORMS.

On the 2d a thunder-storm prevailed from 6 to 6.30 p. m. at Saint Louis, Mo., during which one person was killed by lightning, a house was struck by lightning and burned, and the operation of electric wires was suspended. In the evening a heavy thunder-storm, attended by hail, occurred at Port Huron, Mich.; 0.51 inch of rain fell in 15 minutes; the wind attained a velocity of 42 miles per hour; a number of buildings were struck by lightning; and trees that were prostrated by the storm appeared to have been twisted off. At Omaha, Nebr., a thunder-storm began at 11.55 p. m., 2d, and ended 3 a. m., 3d, and much damage was caused by high wind and heavy rain. On the 3d an unusually severe thunder-storm,

accompanied by high wind and heavy rain, passed over the northern part of Detroit Mich., its path being marked by demolished buildings, prostrated trees, etc. Severe storms were also reported throughout lower Michigan on this date. At Bradshaw, Nebr., a funnel-shaped cloud was observed in the southwest at 7.20 p. m., the funnel of which appeared to reach from the cloud to the earth; it suddenly scattered, and as quickly formed again; anew it scattered and formed, and swinging to and fro, had the form of an elephant's trunk. At this time what appeared a black cloud formed near the ground and assumed the form of an inverted funnel, making the clouds appear like an immense hour-glass; next the depression in the middle filled until the cloud became a solid column from one-third to one-half mile in diameter, in which form it passed over the city. Twelve persons were reported killed, and many were injured; the damage done to property is carefully estimated at \$108,800, not including loss of live stock. At Glenwood, Iowa, a terrific wind and rain storm advanced from the west at 2 a. m., damaging buildings and blowing down trees. At Dubuque, Iowa, severe thunder-storms, attended by unusually heavy rain, prevailed during the 2d, 3d, and 4th, and two lives were reported lost in wash-outs on the railroads. The Iowa Weather and Crop Service report states "that on the afternoon of the 4th a number of small but vigorous tornadoes occurred in Adair, Guthrie, Dallas, Boone, Webster, Hamilton, Hardin, Humboldt, and Howard counties, Iowa. The tracks were not continuous, and the tornado clouds arose and descended at intervals, making long jumps between the points of contact with the earth. The first tornado was reported near Adair, Adair Co., about 1.30 p. m., moving in a northeasterly direction; several barns were destroyed; trees were prostrated; wire fences were rolled up in balls, and poultry was stripped of feathers. This storm descended in the vicinity of Dawson, Dallas Co., and Angus, Boone Co., demolishing a large railroad bridge, destroying much property, and injuring many persons. The track of the tornado was traceable through the northern part of Boone county, where considerable damage was done at points where it descended to the earth. At about the same hour a heavy wind storm struck Grant township, Hardin Co., destroying a number of buildings. About 3.30 p. m. a tornado visited Chester township, Howard Co., destroying a school-house in which school was in session, and wrecking a number of farm buildings, without, however, an attendant loss of life. About 4.30 p. m. a small tornado passed between Badger and Vincent, Webster Co., along the Boone River to the vicinity of Renwick, Humboldt Co.; an iron bridge across the Boone River was wrecked; a few farm buildings and some stock were destroyed, and one person was reported killed."

On the 5th a heavy hail storm passed over Huronia Beach, 3 miles north of Port Huron, Mich., from 2.05 to 2.25 p. m.; at the same time a heavy thunder-storm, attended by hail, occurred at Marine City, 18 miles south of Port Huron, and vessels passed through heavy hail storms 15 miles north of Port Huron. In each instance the hail-stones were reported large and irregular in shape. A severe wind storm began at Davenport, Iowa, at 11 a. m., and attained a velocity of 54 miles per hour, causing considerable damage to fruit trees. A thunder-storm, accompanied by heavy rain, occurred at Sault de Ste. Marie, Mich., in the morning, and damage was caused by the flooding of cellars, washing out of streets, etc. On the 7th a severe wind, rain, and hail storm occurred about four miles west of Crowley, La., which flooded a considerable extent of country and damaged crops. A press dispatch from Van Horn, El Paso Co., Tex., stated that a heavy rain and hail storm passed south and north of that place the evening of the 8th. On the 9th a heavy wind storm prevailed at Halifax, N. S., during which vessels dragged their anchors. At Pensacola, Fla., a black, well-defined, funnel-shaped cloud appeared over the bay about 2 miles south-southwest of the city from 7.53 to 8.10 p. m.; it descended at intervals to within several hundred feet of the water, and moved in a northwesterly direction. On the 10th a tornado passed through Will Co., Ill., about 9 p. m., devastating a large strip of country, and killing or injuring a number of persons. Heavy storms also occurred in De Witt and Morgan counties, Ill., in Louisa Co., Iowa, and in Hamilton Co., Ohio. A wind and hail storm damaged crops in Cumberland Co., Pa. Electrical storms were reported in Berks and Erie counties, Pa., at night. Electrical storms occurred in Randolph Co., Mo., and in Essex Co., Mass.; and a wind, rain, and hail storm in Rockingham Co., Va. On the 11th a hail storm occurred near Clifton, S. C., damaging cotton and other crops. Crops were reported damaged by wind and hail in the northern part of Jefferson Co., Ala. At Hartford City, Ind., a destructive wind, rain, and hail storm occurred in the afternoon. At Kokomo, Ind., the storm was the most destructive in years; streets and houses were flooded; great damage was done by hail; and in the country growing wheat was beaten down. A thunder-storm of unusual severity, attended by heavy rain, caused considerable damage at Erie, Pa., in the evening. A heavy thunder-storm, with rain and high wind, occurred at Cincinnati, Ohio, in the evening; the wind attained a velocity of 44 miles per hour, and houses were unroofed and trees prostrated in the surrounding country. A thunder-storm occurred at Saint Louis, Mo., in the afternoon. The first precipitation was in the form of hail without rain. The hail-stones rapidly increased in size as the storm continued, from about one-half inch to two and one-half inches in diameter. The larger stones were irregular in shape and were composed of a sphere of ice about three-fourths of an inch in diameter surrounded by a layer of snow one-eighth to one-fourth inch thick outside of which was a layer of ice of irregular thickness. But little damage was done by the hail.

On the 12th a thunder-storm, attended by heavy rain, small hail, and high wind, passed over Baltimore, Md., in the afternoon. Much damage was caused along the water front, wharves being flooded, and in the country buildings were blown down and crops were injured by hail. A severe thunder-storm occurred at Harrisburg, Pa., causing damage to electric wires. Heavy rain storms occurred in central New York, flooding towns, washing out railroads, and damaging crops. A cloud-burst occurred at Maysville, Ky., at night, causing small streams to overflow, washing away small buildings, and causing washouts on railroads. A thunder-storm passed over Chattanooga, Tenn., in the morning; lightning struck in several places, and damage was done to electric wires. A heavy thunder-storm moving east occurred at Steele, N. Dak., commencing at 1.45 a. m., central time; the lightning was incessant and the thunder very heavy for several hours; no hail fell; no funnel cloud was observed, and there was no evidence that the storm had a whirling motion; a

heavy wind commenced at the time the wind-direction changed from southeast to west; there was no period of calm, and objects were carried either ne. or e.; the rainfall was heaviest before the heavy wind. Two storerooms that were tightly closed had windows broken on the north side by a force from within. In one case the window and frame burst out, the frame being about 6 by 12 feet, and in the other one glass 24 by 36 inches was broken. Two patches of gravel roof, one about 10 and the other about 4 feet square were also blown out. The wind at the time was blowing from sw. or w., and continued less than one minute. On the 13th a thunder-storm, attended by high wind and heavy rain, occurred at Logansport, Ind.; hail the size of hickory nuts fell for 20 minutes. At Rockford, Ill., a destructive thunder-storm, with excessive rain, began 8.30 p. m., and continued 3 hours. A thunder-storm, with heavy rain and some hail, occurred at Moorhead, Minn., in the evening; some of the hail-stones were one-half inch in diameter. On the 14th a thunder-storm, with heavy rain and hail, passed over Springfield, Ill., in the evening, the hail-stones being the size of hazel nuts; several washouts were reported on the railroads. At Cadiz, Wis., a thunder-storm began on the 13th and ended on the 14th; the rainfall was excessive, and caused the overflow of streams and flooding of low lands. At Dubuque, Iowa, heavy rain with thunder began 11 a. m., 13th, and continued at intervals until the evening of the 14th, causing considerable damage.

On the 14th a thunder-storm, moving northeast, passed over Monmouth, Ill., about 6 p. m., central time, attended by heavy rain and some hail; the Opera House and Masonic Building were unroofed, entailing a loss of about \$800. A heavy thunder-storm occurred at Rock Island, Ill., about 9 p. m., central time. The storm moved southeast, with heavy rain, and buildings, trees, etc., were damaged to the extent of \$10,000 to \$12,000. At 5 p. m., central time, a tornado, moving northeast, passed 4 to 5 miles north of Monticello, Ill., attended by a heavy fall of hail-stones, some of which were $2\frac{1}{2}$ inches in diameter, but little thunder and lightning, and heavy rain, which was more abundant after the passage of the tornado; large trees were torn up by the roots and others were broken off, and some of the trees were carried nearly 100 feet. A few hundred feet from the storm's path scarcely a breath of air stirred, although much hail fell. A heavy thunder-storm passed southeast over Birkbeck, Ill., at 11.20 a. m., central time, with heavy rain and hail; a school-house was blown down, severely injuring 5 children, and 2 houses and 2 barns were unroofed, the loss to buildings being estimated at nearly \$500. A tornado occurred near White Heath, Ill., at 5 p. m., central time. When 3 miles west of that place a funnel-shaped cloud was observed which seemed to descend to the ground when about $1\frac{1}{2}$ mile west of White Heath, where it struck timber and destroyed everything in its path for about $1\frac{1}{2}$ mile, after which it ascended and passed about $\frac{1}{2}$ mile north of the town; the rain was light before and heavy after the storm, and no hail fell within 5 or 6 miles. On the 15th a severe thunder-storm, with heavy rain and high wind, occurred at Cincinnati, Ohio, in the afternoon; sewers were inadequate to carry off the immense volume of water; some of the streets ran full from curb to curb; street railways were obliged to suspend operations, and the damage to property was estimated at several thousand dollars. On the 16th a thunder-storm, with hail, occurred at Offerle, Kans., the hail-stones being very large. The cloud formed overhead, and passing southeast developed into a tornado in the southeast part of Edwards county, where 2 persons were injured, some stock killed, and buildings were destroyed. At 4.05 a. m. a funnel-shaped cloud passed over Lincoln, Nebr.; the cloud had a whirling motion from right to left, and was attended by heavy rain, more especially after its passage, and damaged property to the value of about \$25,000. On the 17th a cloud-burst occurred at Ocoola, Pa., at night, doing great damage to railroad and private property, drowning 2 persons, and carrying away stock. A tornado, with large hail and heavy rain, occurred near Lebanon, S. Dak., in the

evening, causing great destruction to buildings and crops. During the storm the Little Cheyenne River rose 25 feet in 30 minutes, drowning 9 persons and destroying considerable property. At 1.50 p. m. a moderate thunder-storm set in at Detroit, Mich., which, however, was attended by the highest wind velocity recorded since the establishment of the Signal Service station at that place in 1870. A velocity of 60 miles per hour from the nw. was registered at 4.21 p. m., and an extreme velocity of 125 miles per hour. The wind gust came and passed with surprising suddenness, causing buildings to tremble as if an explosion had taken place. With the exception of one building in course of erection, which was blown down, the damage done by the storm was slight. At Port Huron, Mich., rain began falling at 2.40 p. m., with loud thunder, vivid lightning, and large hail; the storm was of brief duration. In the surrounding country damage was done to crops by hail, and a number of bridges across small streams were carried away.

On the 18th a severe thunder-storm occurred in the morning at Huron, S. Dak., and heavy rain was reported in the north and west parts of the state. At 4.20 p. m., a thunder-storm, attended by heavy rain and a well-defined whirlwind, occurred at Norfolk, Va.; numerous casualties were reported, and 0.90 inch of rain fell in 18 minutes. Heavy thunder-storms prevailed in Me., and several buildings were struck by lightning. Heavy thunder-storms occurred in southeastern Ky. and the adjoining part of Tenn. A heavy storm, attended in places by hail, passed over Iowa and Vernon counties, Wis., in the evening, and much damage was caused by flooding of small streams. A heavy rain and thunder-storm visited Pleasants Co., W. Va., at night, and a large quantity of lumber was swept away and crops were injured by flooding of small streams. On the 19th a tornado occurred at Bolling Springs, S. C. The cloud was funnel-shaped, and timber and crops were destroyed in its path. At the beginning the path was 20 to 30 feet wide, but as the storm progressed it grew wider. Lands were badly washed by heavy rain attending the tornado. Severe electrical storms, attended by heavy rain and high wind, prevailed at night in northeastern Kans. and western Mo. At Atchison, Kans., great damage was caused by flooding of streets and cellars, and in the country small streams overflowed, sweeping away bridges, etc. On the 20th a tornado passed over Lee Co., Ill., about 3½ miles south of West Brooklyn, about 4 p. m. It consisted of a funnel-shaped cloud, the top of which appeared nearly a mile wide; the portion extending to the ground was inky black, and clouds were rushing from all sides toward the funnel. The clouds revolved with great rapidity in a direction contrary to the movement of the hands of a watch, and buildings near the north edge were carried west from their foundations. On each side of the track objects mowed down by the storm were leaning towards the centre, while 10 to 15 rods farther from the track no damage was caused. Twelve persons were reported killed, and the loss to property was estimated at \$200,000. A tornado was reported west of Cornell, Livingston Co., Ill., in the afternoon; its path was about 80 rods wide and 4 miles long; several persons were injured, and every object in its path was wrecked or injured. About 5 p. m., central time, a tornado passed through Lodge, Piatt Co., Ill. A funnel-shaped cloud was seen; the rainfall was light, more rain falling after than before the passage of the tornado cloud; no hail fell; and chain lightning was observed, with but little thunder. The storm moved east with a whirling motion and attended by a roaring sound; small buildings were torn to pieces; trees in the centre of the path fell to the east; no persons were killed or injured, and the loss to buildings was about \$500. On the 22d a thunder-storm, with vivid lightning and heavy rain, occurred at Baltimore, Md., in the evening; heavy rain caused injury to crops, and a number of buildings were struck by lightning in the surrounding country. A thunder-storm of unusual severity visited Boone Co., Ill.; railroad tracks were washed out, and a heavy hail storm caused

considerable damage a few miles north of Belvidere, Ill. The heaviest rain storm in many years occurred at Carson, Iowa, doing an immense amount of damage to crops, etc. At night a hail storm occurred at Logan, Iowa, which damaged fruit, grain, etc., and heavy rain flooded lowlands along the Boyer River. A tornado passed through Sweetwater, Nebr., at 3.20 p. m.; the cloud formed in the southwest, with thunder and lightning, about 1 hour before it assumed a funnel shape; it then seemed to twist and turn, and objects in its path seemed to fall in every direction; a number of persons were injured, and the damage to property was estimated at \$25,000. A severe electrical storm swept over Omaha, Nebr., between 8 and 9 p. m.; much damage was caused by heavy rain; and 1 person was killed, and several houses were struck by lightning. The storm was also very severe at South Omaha, Nebr.

On the 23d a violent storm passed over Dayton, Ky., at 6 p. m., damaging property to the amount of about \$18,000. A severe thunder-storm, with heavy wind, rain, and hail, visited the Juniata Valley, Pa., in the afternoon, doing much damage to crops in Huntingdon county. On the 24th an unusually heavy rain storm occurred at Fayette, Iowa; great damage was caused to crops, and roads and railroads were washed out. Destructive hail storms were reported in Colusa Co., Cal. On the 27th a tornado was reported in the eastern part of Washburn Co., Wis., in the afternoon, which caused much damage to buildings, trees, and crops. At Marquette, Mich., a thunder-storm, with heavy rain, began 12.30 a. m. and ended during the night, causing washouts. At Fort Buford, N. Dak., a heavy thunder-storm began 1.22 p. m.; heavy rain fell; the wind attained a velocity of 56 miles per hour. In the Yellowstone Valley, 25 miles sw. of Fort Buford, a heavy hail storm occurred, which destroyed vegetation and caused other damage. On the 28th a storm passed over Portland and Orange, Ionia Co., Mich., causing great damage to timber and crops. At Detroit, Mich., a severe thunder-storm occurred in the morning, during which several houses were struck by lightning, and at 2.15 p. m. an unusually severe thunder and rain storm, with high wind, set in; some damage was done by the wind, and a man was killed by lightning. On the 29th an electrical, rain, and wind storm occurred at Sheffield, Ala. On the 30th a heavy thunder-storm, with heavy rain, occurred at Columbus, Ohio, in the evening; a number of persons were stunned and two were killed by lightning. A heavy electrical storm began at Wheeling, W. Va., about 5 p. m., and lasted one hour; the storm advanced from the southwest, and the heavy rainfall flooded streets in the lower part of the city.

Akron, Ohio, Tornado of May 10, 1890.

The following is a corrected report of the Akron, Ohio, tornado of May 10, 1890, furnished the Ohio Meteorological Bureau by Prof. H. V. Egbert, Buchtel College, Akron, Ohio:

The tornado struck the southwest limit of the city and continued its course in a direction N. 60° E. for a distance of 2 miles, and again lifted at the eastern limit of the city to do no more damage for a distance of 5 miles, when it unroofed a barn and uprooted a few trees. Quantities of tarred paper, probably carried from Akron, were found at a distance of 10 miles. The path through Akron was slightly curved, being concave on the north or left side, and exhibited slight irregularities. The width of the path of greatest destruction varied but little from 50 feet, though trees were prostrated in a path up to 250 feet in width. The lowest estimate of its rate of progress was 50 miles an hour. I saw it only during one-fourth of a mile of its course, and being occupied, did not notice its duration of visibility, but an estimate made immediately afterwards placed it at 4 seconds. This makes a rate of 225 miles per hour. This seems an extreme one, but in the absence of any definite knowledge is perhaps as reliable as any other estimate. The tornado passed about the middle of its path at 4.54 p. m., central time. Several observers report seeing two clouds come together, one from nw. and the other from sw., and that after meeting they began to whirl and bore down upon a house in the outskirts of the city, which was the first thing injured. This house was completely ruined, only the floor and parts of the sides remaining near, the rest, including furniture, being carried away. After leaving this house the tornado did no serious damage for some distance. This character attended the tornado throughout its course; serious damage would result for some distance, then little or none for some distance further. Some of the observers state that the cloud lifted at times and passed over the house tops. Besides the house first spoken of four houses were entirely destroyed, being carried from their

foundations and literally mashed to pieces. Three of these seemed to have been pushed off their foundations in the direction of the storm's progress and mashed, while the fourth was rolled over, as shown by marks on the ground, and the fact that the floors were upside down. Another house was rolled over on its side and left intact.

To sum up, 5 houses were completely demolished; 8 barns were completely destroyed, and 1 rolled over; 14 houses were moved from their foundations, some only a few inches, and others 10 to 12 feet; in two cases houses fell towards each other; 2 barns were displaced; the east side of one house was torn out, probably owing to the fact that it had a square front rising above the roof; 10 houses and 2 barns were unroofed to a greater or less extent; a large pottery, south of what appeared to be the path of the tornado, had its roof torn off and carried nearly in the direction of the storm's progress; the top of the brick wall of the pottery was injured somewhat, but the north end of the building was torn out, the upper bricks being thrown a distance of 15 feet, the lower ones not so far. The appearance was that some force had pushed the wall over, while shelving immediately inside was intact. This may have been an explosion, as I could not conceive of any way in which the departing roof could give the wall such an outward shove. All prostrations of trees in the immediate path of the storm were in the direction of the storm's progress, as nearly as could be expected, considering the unequal resistance by the different roots of a tree, and by the shape and size of houses. Objects outside the path were prostrated in general toward the path and, roughly, at right angles to it. In some few cases the prostrations were almost exactly the opposite of this, and I have noticed, chiefly on the north side, that some of the trees were prostrated to the n. and nw. In no case have I found that a tree moved after it struck the ground; they were simply pushed over, one-half the roots being pulled out of the ground, the other half remaining firmly in the

ground. In the midst of fallen trees are others standing, some showing by openings in the ground, at one side, that they had experienced strong wind, while others, apparently under the same conditions, show no such evidence.

Of the material carried forward by the storm very little was left over 150 feet from the main line of the storm. Timbers and boards were left lying almost entirely lengthwise of the storm's path. Two cases are reported where south cellar doors of houses north of the storm's path were blown open. In shape the tornado cloud has been very generally described as a cone, though by no means regular in its outlines, nor do the cones described agree in shape, as they vary from the conventional cone of geometry, with wide base, to the pineapple cone. Observers state that the cloud column was not a solid column of cloud, but was made up of detached, fragmentary cloud masses. All report that the motion was counter-clockwise. Two observers saw the tornado cross streets, and using width of street as a unit of measure, the base of the cloud column had a diameter of 40 to 50 feet. Many report that its passage was attended by a noise resembling that made by a train of cars. The general conditions of the weather were: a large cloud overspread the sky from the southwest, and the wind was from the same quarter and very light. I was one-fourth of a mile north of the tornado when it passed, and there was no perceptible breeze. Inside of a minute after it passed a sharp breeze sprang up from the northwest, which died out in a short time. The lightning in the general storm was mild, and observers say that there was none in the cloud column. No hail was reported. Rain was not excessive and apparently did not change in quantity after the tornado passed. After the wind changed to northwest the clouds began to break, and the late evening was almost entirely clear. It is difficult to decide upon which side of the track the force of the storm was greater. The total amount of damage is estimated at about \$80,000. No lives were lost; three persons were seriously and several slightly injured.

INLAND NAVIGATION.

FLOODS.

The Mississippi River fell below the danger-line at Vicksburg, Miss., on the 3d, and at New Orleans, La., on the 12th. Large areas of swamp and low land in southeastern and southern La., and tracts of land in the river parishes as far north as Madison parish, La., were under water during the month. In the early part of the month melting snow in the Sierra Nevada Mountains caused the Carson River to overflow its banks, and thousands of acres of land in Ormsby and Douglas counties, Nev., were inundated. Advices dated the 7th state that great damage was caused by floods in Ontario, Canada. Railroads and dams were washed out; buildings and bridges were swept away; and much live stock was drowned. Reports of the 12th state that great damage was caused by floods in central N. Y. Large quantities of lumber and buildings were washed away by the overflow of streams, and traffic on railroads was delayed by washouts. On the 13th rivers and streams in northern Ill., and southern Wis. were overflowing their banks. At Rockford, Joliet, Elgin, Dixon, Aurora, and other places in northern Ill., great damage was done to property, and southwestern Wis. was largely inundated.

STAGE OF WATER IN RIVERS AND HARBORS.

The following table shows the danger-points at the several stations; the highest and lowest water during June, 1890, with the dates of occurrence and the monthly ranges:

Heights of rivers above low-water mark, June, 1890 (in feet and tenths).

| Stations. | Danger-point range. | Highest water. | | Lowest water. | | Monthly range. |
|---------------------------|---------------------|----------------|---------|---------------|---------|----------------|
| | | Date. | Height. | Date. | Height. | |
| <i>Red River:</i> | | | | | | |
| Shreveport, La..... | 39.9 | 1 | 23.3 | 30 | 11.7 | 11.6 |
| <i>Arkansas River:</i> | | | | | | |
| Fort Smith, Ark.... | 22.0 | 5 | 11.2 | 22 | 2.3 | 8.9 |
| Little Rock, Ark.... | 23.0 | 28 | 13.7 | 25 | 6.2 | 7.5 |
| <i>Missouri River:</i> | | | | | | |
| Ft. Buford, N. Dak..... | | 7 | 12.3 | 13 | 7.5 | 4.5 |
| Sioux City, Iowa..... | | 7 | 13.5 | 16 | 9.1 | 4.4 |
| Omaha, Nebr..... | 18.0 | 9 | 12.9 | 1 | 5.4 | 4.5 |
| Kansas City, Mo..... | 21.0 | 11 | 17.2 | 1 | 8.9 | 8.3 |
| <i>Mississippi River:</i> | | | | | | |
| Saint Paul, Minn.... | 14.5 | 23 | 7.0 | 1 | 3.7 | 3.3 |
| La Crosse, Wis.... | 24.0 | 15 | 9.7 | 1 | 7.4 | 2.3 |
| Dubuque, Iowa.... | 16.0 | 26 | 14.2 | 1 | 7.0 | 7.2 |
| Davenport, Iowa.... | 15.0 | 29 | 11.7 | 1 | 4.4 | 7.3 |
| Keokuk, Iowa.... | 14.0 | 30 | 12.6 | 1 | 4.1 | 8.5 |
| Saint Louis, Mo.... | 32.0 | 30 | 20.7 | 3,4 | 11.6 | 9.1 |
| Cairo, Ill..... | 40.0 | 1 | 33.1 | 12 | 21.4 | 11.7 |
| Memphis, Tenn.... | 34.6 | 1 | 26.3 | 15 | 17.4 | 8.9 |
| Vicksburg, Miss.... | 41.0 | 1 | 41.3 | 30 | 28.9 | 12.4 |
| New Orleans, La.... | 13.0 | 1, 2, 3 | 13.7 | 30 | 10.7 | 3.0 |
| <i>Ohio River:</i> | | | | | | |
| Pittsburgh, Pa..... | 22.0 | 22 | 8.5 | 30 | 2.3 | 6.2 |
| Parkersburg, W. Va.... | 35.0 | 22 | 16.2 | 14 | 6.0 | 10.2 |
| Cincinnati, Ohio.... | 50.0 | 1 | 37.5 | 10 | 16.0 | 21.5 |
| Louisville, Ky..... | 25.0 | 1 | 14.8 | 10 | 7.2 | 7.6 |
| <i>Cumberland River:</i> | | | | | | |
| Nashville, Tenn.... | 46.0 | 1 | 17.1 | 30 | 3.3 | 13.8 |
| <i>Tennessee River:</i> | | | | | | |
| Chattanooga, Tenn.... | 33.0 | 1 | 6.1 | 30 | 3.1 | 3.0 |
| <i>Monongahela River:</i> | | | | | | |
| Pittsburgh, Pa..... | 29.0 | 22 | 8.5 | 30 | 2.3 | 6.2 |
| <i>Savannah River:</i> | | | | | | |
| Augusta, Ga..... | 32.0 | 4 | 9.4 | 30 | 6.1 | 3.3 |
| <i>Willamette River:</i> | | | | | | |
| Portland, Oregon.... | 15.0 | 1 | 17.6 | 29, 30 | 13.4 | 5.2 |

ATMOSPHERIC ELECTRICITY.

AURORAS.

Auroras were reported as follows: 7th, Lyons, N. Y. 8th, Carson, Iowa; Quakertown, Pa. 19th, Quakertown, Pa.

THUNDER-STORMS.

The more severe thunder-storms of the month are described under "Local storms." East of the Rocky Mountains thunder-storms were reported in the greatest number of states, 30 to 34, on the 5th, 6th, 11th to 15th, 18th, and 23d; in 20 to 29 on the

1st, 3d, 4th, 7th, 9th, 10th, 16th, 17th, 19th to 22d, and 24th to 30th; in 19 on the 2d; and in 14 on the 8th.

East of the Rocky Mountains thunder-storms were reported on the greatest number of dates, 30, in Fla., N. C., and Tenn.; on 20 to 29 in Ala., Ga., Ill., Ind., Iowa, Kans., Ky., La., Mich., Minn., Miss., Mo., Mont., Nebr., N. Y., N. Dak., Pa., S. C., S. Dak., Tex., and Wis.; on 10 to 19 in Ark., Md., Mass., N. H., N. J., R. I., Vt., Va., and W. Va.; and on 1 to 9 in Conn., D. C., Ind. T., Me., and S. C. West of the Rocky

Mountains thunder-storms were reported as follows: Ariz., 8th, 17th, 25th, 27th, and 30th; Cal., 1st, 11th, 15th, 23d, 24th, 29th, and 30th; Colo., 1st, 6th, 9th, 10th, 13th, 16th to 19th, 23d, and 26th to 30th; Idaho, 1st, 9th, 11th, 14th, 15th, 17th to 19th, 25th, and 30th; Nev., 16th, 19th, 29th, and 30th; N.

Mex., 6th, 8th, 17th, 18th, and 28th to 30th; Oregon, 23d, 30th, and 31st; Utah, 2d to 9th, 20th, and 25th; Wash., 7th, 11th, 16th, 17th, 23d, and 25th; Wyo., 3d, 10th, and 25th to 27th. There were no states or territories west of the Rocky Mountains in which thunder-storms were not reported.

MISCELLANEOUS PHENOMENA.

HALOS.

In the MONTHLY WEATHER REVIEW from January to May, 1890, inclusive, the solar and lunar halos reported in the several sections of the country have been considered in connection with precipitation on the days attending and the second and third days following their occurrence, and also with relation to their occurrence in advance, or following the passage, of storms. This treatment of halos for the period named shows that 73 per cent. of the halos were attended on the first day, 70 per cent. were followed on the second day, and 62 per cent. were followed on the third day by precipitation, and indicates that about three-fourths of the halos noted in the United States were attended on the same day by precipitation at or near the station where they were observed. As regards the percentage of halos which were followed on the second and third days by precipitation in any given district, it is shown that in a large majority of instances halos were also reported for the three consecutive dates. In considering the relations of halos with storms it has been found that in districts lying east of the Rocky Mountains 57 per cent. of the halos occurred in advance, or within the eastern quadrants, of well-defined storms, and that 43 per cent. of the halos were noted in the western quadrants of areas of low pressure or within the limits of areas of high pressure. In the Rocky Mountain and plateau regions less than 50 per cent., and on the Pacific coast less than 20 per cent. of the halos occurred within the influence, or in advance, of storms. As about 75 per cent. of the halos reported were attended on the same day by precipitation at or near the place of observation, and nearly 50 per cent. of the halos occurred after the passage of, and attending, the clearing conditions which follow storms, it will be seen that halos indicate merely a moist condition of the atmosphere, and that they point to a prevalence, or to a strong probability of the occurrence on the same day, of precipitation in the districts where they are observed.

In future issues of the MONTHLY WEATHER REVIEW halos of unusual brilliancy or of a remarkable character only will be noted, and in such cases full descriptions will be given.

DROUGHT.

Drought damaging to crops and vegetation was reported near Charlotte, N. C., Double Springs, Ala., Santa Maria and Mesquite, Tex., Lead Hill, Ark., Howe, Nebr., La Monte and Oak Ridge, Mo., Havensville, Kans., and Lexington, Nebr.

MIRAGE.

At Duluth, Minn., a fine mirage was observed from 11.00 a. m. to 12.30 p. m., 16th. The Wis. shore for 20 to 30 miles stood out in bold relief; forests at an unknown distance

appeared inverted; and the mouth of the Brule River, 20 miles distant, was plainly visible.

SUN SPOTS.

Haverford College Observatory, Pa. (observed by Prof. F. P. Leavenworth):

| Date. | Number of new— | | Disappeared by solar rotation. | | Reappeared by solar rotation. | | Total number visible. | | Faculae. | Remarks. |
|--------------|----------------|--------|--------------------------------|--------|-------------------------------|--------|-----------------------|--------|----------|--------------------------------|
| | Groups. | Spots. | Groups. | Spots. | Groups. | Spots. | Groups. | Spots. | | |
| June, 1890. | | | | | | | | | | |
| 1, 1 p. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | Definition good. |
| 2, 10 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | Definition good. |
| 3, 10 a. m. | 2 | 5 | 0 | 0 | 0 | 0 | 2 | 5 | 2 | Definition good; spots small. |
| 4, 10 a. m. | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | Definition good; spots small. |
| 5, 10 a. m. | 0 | 6 | 0 | 0 | 0 | 0 | 1 | 7 | 1 | Definition fair. |
| 6, 10 a. m. | 0 | 4 | 0 | 0 | 0 | 0 | 1 | 11 | 0 | Definition poor. |
| 7, 10 a. m. | 0 | 4 | 0 | 0 | 0 | 0 | 1 | 15 | 1 | Definition good; 1 large spot. |
| 8, 10 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 1 | Definition bad; 1 large spot. |
| 9, 9 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 1 | Definition poor; spots small. |
| 10, 9 a. m. | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 3 | 1 | Definition good. |
| 11, 9 a. m. | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 3 | 0 | Definition fair. |
| 12, 12 m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | Definition fair. |
| 13, 10 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | Definition fair. |
| 14, 9 a. m. | 1 | 4 | 0 | 0 | 0 | 0 | 1 | 4 | 3 | Definition good; spots small. |
| 15, 10 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | Definition good. |
| 16, 10 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Definition fair. |
| 17, 10 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Definition poor. |
| 18, 10 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Definition poor. |
| 19, 10 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Definition good. |
| 20, 10 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Definition poor. |
| 21, 12 m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Definition poor. |
| 22, 9 a. m. | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | Definition good. |
| 23, 5 p. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | Definition good. |
| 24, 10 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | Definition good. |
| 25, 10 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | Definition fair. |
| 26, 10 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | Definition fair. |
| 27, 10 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | Definition poor. |
| 28, 11 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Definition fair. |
| 29, 10 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | Definition good. |
| 30, 10 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Definition fair. |

Mr. C. E. Buzzell, Leaf River, Ill.: June 4th and 5th, poor definition; 6th, two small groups near meridian in south latitude, unchanged on 7th, and decreasing on the 8th; 9th and 10th cloudy, clear disc on 11th. None seen on other dates.

Mr. John W. James, Riley, Ill.: observations taken on 1st to 4th, 6th, 7th, 8th, 10th to 13th, 19th, 21st to 30th, or on 22 days of the month, but the only spots seen were: 6th, one group, estimated 31,600 miles long, two days from western edge of the disc; and 7th to 8th, one spot.

Mr. M. A. Veeder, Lyons, N. Y.: 1st, a group of faculae was about two days advanced from the eastern limb; 5th, spots were seen in the vicinity of this group, and gradually increased in size during the remainder of transit. Faculae appeared by rotation at the eastern limb, 2d, 5th, 7th, 25th, and 26th. Faculae were seen at the western limb, 1st and 6th.

H. D. Govey, North Lewisburgh, Ohio: sun spots were observed on the 7th and 8th.

VERIFICATIONS.

CAUTIONARY SIGNALS FOR JUNE, 1890.

[Verifications made by Assistant Professor C. F. Marvin, assisted by Mr. H. E. Williams, chief clerk of the Forecast Division.]

Statement showing percentages of justifications of wind signals for the month of June, 1890:

Wind signals.—(Ordered by Assistant Professor H. A. Hazen.) Total number of signals ordered, forty-three; justified

as to velocity, wholly, twenty-two, partly, one; justified as to direction, forty-three. Of the signals ordered, thirty-nine were cautionary signals, of which nineteen were wholly justified; and four were storm signals, of which three were wholly, and one partly justified. Twenty-seven signals were ordered for easterly winds, and sixteen for westerly winds, all of which were justified. Percentage of justifications, 59.8.

No cold-wave signals were ordered during the month.

FORECASTS FOR 24 HOURS IN ADVANCE.

The forecasts for districts east of the Rocky Mountains for June, 1890, were made by Assistant Professor H. A. Hazen, and those for the Pacific coast districts were made at San Francisco, Cal., by 2d Lieutenant J. E. Maxfield, Signal Corps.

Percentages of forecasts verified, June, 1890.

| States. | | States. | |
|---------------------------|------|---|------|
| Maine..... | 68.4 | Kentucky..... | 86.1 |
| New Hampshire..... | 76.1 | Ohio..... | 82.6 |
| Vermont..... | 79.9 | West Virginia..... | 83.9 |
| Massachusetts..... | 76.3 | Indiana..... | 80.9 |
| Rhode Island..... | 77.8 | Illinois..... | 84.8 |
| Connecticut..... | 74.5 | Lower Michigan..... | 79.5 |
| Eastern New York..... | 77.8 | Upper Michigan..... | 76.3 |
| Western New York..... | 71.6 | Wisconsin..... | 75.9 |
| Eastern Pennsylvania..... | 82.8 | Minnesota..... | 72.3 |
| Western Pennsylvania..... | 80.3 | Iowa..... | 73.3 |
| New Jersey..... | 75.3 | Kansas..... | 79.1 |
| Delaware..... | 80.6 | Nebraska..... | 74.7 |
| Maryland..... | 85.4 | Missouri..... | 85.1 |
| District of Columbia..... | 84.5 | Colorado..... | 86.3 |
| Virginia..... | 84.5 | North Dakota..... | 73.7 |
| North Carolina..... | 84.4 | South Dakota..... | 79.5 |
| South Carolina..... | 84.3 | Southern California*..... | 92.6 |
| Georgia..... | 85.1 | Northern California*..... | 88.9 |
| Eastern Florida..... | 85.3 | Oregon*..... | 77.8 |
| Western Florida..... | 87.9 | Washington*..... | 79.5 |
| Alabama..... | 86.2 | By elements: Weather..... | 84.6 |
| Mississippi..... | 86.6 | Temperature..... | 75.9 |
| Louisiana..... | 87.6 | Monthly percentage of weather and temperature combined..... | 81.1 |
| Texas..... | 92.6 | | |
| Arkansas..... | 85.7 | | |
| Tennessee..... | 82.5 | | |

* In determining the monthly percentage of weather and temperature combined, the Pacific coast states are not included. † The forecasts of temperature in districts east of the Rocky Mountains for June, 1890, were made with reference to the maximum temperature alone; that is, a prediction of warmer or cooler indicated that the maxi-

mum temperature of the day designated would be higher or lower than the maximum of the previous day. ‡ The monthly percentage of weather and temperature combined is determined by multiplying the percentage of weather by 6, and the percentage of temperature by 4, and dividing their sum by 10.

FORECASTS FOR 48 AND 72 HOURS IN ADVANCE.

Appreciating the great importance that long time predictions possess for the general public the Chief Signal Officer has authorized forecasts for forty-eight and seventy-two hours, covering the second and third days in advance. Such forecasts are optional with the predicting officer, and are only made when clearly in the public interest, and cover, in all cases, considerable areas of country, and are not confined to localities.

Percentages of verifications of forecasts made for second day in advance. Number of predictions made: weather, 43; temperature, 102. Percentages of verifications: weather, 88.8; temperature, 72.2. Weather and temperature combined, 78.6. For third day in advance. Number of predictions made: weather, 6; temperature, 8. Percentages of verifications: weather, 91.7; temperature, 61.2. Weather and temperature combined, 77.4.

Percentages of verifications of weather and temperature signals reported by directors of the various State Weather Services for June, 1890.

| States. | Weather. | Temperature. | States. | Weather. | Temperature. |
|----------------|----------|--------------|----------------------------|----------|--------------|
| Illinois..... | 78.8 | 83.2 | New Jersey..... | 85.4 | 91.2 |
| Indiana..... | 78.0 | 87.0 | North and South Dakota.... | 82.0 | 75.0 |
| Michigan..... | 84.0 | 86.0 | Ohio..... | 80.0 | 87.0 |
| Minnesota..... | 66.0 | 67.0 | Pennsylvania..... | 86.0 | 92.0 |
| Missouri..... | 85.0 | 89.0 | South Carolina..... | 77.0 | 81.4 |
| Nebraska..... | 93.1 | 85.2 | | | |

STATE WEATHER SERVICES.

[Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.]

The following extracts and summaries are republished from reports for June, 1890, of the directors of the various state weather services:

ALABAMA.

The month was hot and dry.

Temperature.—Highest monthly mean, 83.3, at Goodwater; lowest monthly mean, 72.8, at Chepultepec; maximum, 99, at Gadsden, 30th; minimum, 50, at Jasper, 5th; greatest local monthly range, 43, at Jasper; least local monthly range, 17, at Chepultepec.

Precipitation.—Greatest monthly, 5.92, at Uniontown; least monthly, 1.46, at Guntersville.

Wind.—Prevailing direction, southeast.—Prof. P. H. Mell, Auburn, director; J. M. Quarles, Private, Signal Corps, assistant.

ARKANSAS.

Temperature.—The mean was about 1 above the normal; maximum, 106, at Lead Hill, 26th; minimum, 50, at Newport, 8th; greatest local monthly range, 49, at Lead Hill; least local monthly range, 28, at Conway.

Precipitation.—The average was about 0.26 above the normal; greatest monthly, 9.29, at Little Rock; least monthly, 2.18, at Lead Hill.—M. F. Locke, Commissioner of Agriculture, Little Rock, director; W. U. Simons, Sergeant, Signal Corps, assistant.

COLORADO.

Temperature.—The mean was 3 above the average for the past four years; highest monthly mean, 74.5, at Lamar; lowest monthly mean, 43.8, at Leadville; maximum, 103, at Lamar, 22d; minimum, 12, at Breckenridge, 6th; greatest local monthly range, 71, at Breckenridge; least local monthly range, 37, at Cumbres.

Precipitation.—There was about one-half the usual precipitation.

Wind.—Prevailing direction, west.—Prof. F. H. Loud, Colorado Springs, director; W. S. Miller, Sergeant, Signal Corps, assistant.

ILLINOIS.

Temperature.—Highest monthly mean, 80.2, at Winnebago; lowest monthly mean, 70.0, at Sandwich; maximum, 104, at East Peoria, 25th, and at Pontiac, 27th; minimum, 40, at Aurora, 8th; greatest local monthly range, 60, at Pontiac; least local monthly range, 33, at Golconda and Pana.

Precipitation.—Greatest monthly, 13.57, at Cockrell; least monthly, 2.10, at McLeansborough.

Wind.—Prevailing direction, southwest.—John Craig, Sergeant, Signal Corps, Springfield, in charge.

INDIANA.

Temperature.—Highest monthly mean, 82.3, at Huntingburgh; lowest monthly mean, 70.2, at Valparaiso; maximum, 104, at Huntingburgh, 29th,

and at Muncie, 23d; minimum, 35, at Point Isabel, 8th; greatest local monthly range, 60, at Point Isabel; least local monthly range, 32, at Shelbyville.

Precipitation.—Greatest monthly, 10.89, at Huntingburgh; least monthly, 2.26, at Mount Vernon.

Wind.—Prevailing direction, southwest.—Prof. H. A. Huston, La Fayette, director; C. F. R. Wappenhans, Sergeant, Signal Corps, assistant.

IOWA WEATHER AND CROP SERVICE.

The month was the hottest, and in some localities, the wettest June in Iowa in the last twenty years.

Temperature.—Highest monthly mean, 78.4, at Washington; lowest monthly mean, 67.7, at Iowa City; maximum, 106, at Glenwood, 21st; minimum, 44, at Wesley, 11th; greatest local monthly range, 56, at Glenwood; least local monthly range, 33, at Independence.

Precipitation.—Greatest monthly, 16.53, at Fayette; least monthly, 1.57, at Oskaloosa.

Wind.—Prevailing direction, south.—J. R. Sage, Des Moines, director; G. M. Chappel, Sergeant, Signal Corps, assistant.

KANSAS.

Temperature.—The temperature was above the normal in all parts of the state, the average excess being 3.8; highest monthly mean, 86.4, at Ellis; lowest monthly mean, 72.2, near Concordia; maximum, 120, at Collyer, 21st; minimum, 40, at Lakin, 4th and 7th, and at Allison, 9th; greatest local monthly range, 76, at Gibson; least local monthly range, 33, at Salina; greatest daily range, 53, at Lakin, 5th; least daily range, 9, at Leavenworth, 4th.

Precipitation.—There was an excess in Decatur, Norton, Phillips, and Osborne counties, which extended southeastward, culminated in Harvey, and diminished in Sedgwick to Sumner county, where it changed to a deficiency. There was a deficiency of 2.63 in the eastern, and of 2.72 in the western division; greatest monthly, 8.20, at Halstead; least monthly, 0.20, at Gove City.

Wind.—Prevailing direction, south.—Prof. J. T. Lovewell, Topeka, director; T. B. Jennings, Sergeant, Signal Corps, assistant.

KENTUCKY.

Temperature.—The mean was about 4 above the normal; maximum, 101, at Murray, 26th and 29th; minimum, 51, at Pellville, 8th; greatest monthly range, 49, at Murray and Pellville; least monthly range, 29, at South Fork.

Precipitation.—The average was slightly in excess of the normal; greatest monthly, 9.66, at Shelbyville; least monthly, 1.20, at Canton.

Wind.—Prevailing direction, southwest.—Dr. E. A. Grant, Louisville, director; Frank Burke, Sergeant, Signal Corps, assistant.

LOUISIANA.

Frequent excessive local rains occurred, particularly in the southern part of the state, and a very warm period during the latter part of the month.

Temperature.—The mean was 0.1 above the normal; highest monthly mean, 84.5, at Mandeville; lowest monthly mean, 78.2, at Maurepas; maximum, 101, at Mandeville, 14th, and at Cameron, 20th and 28th; minimum, 58, at Marks-ville, 2d, and at Clinton, 6th; greatest local monthly range, 39, at Clinton; least local monthly range, 24, at Emilie.

Precipitation.—The average was 2.02 above the normal; greatest monthly, 12.32, at Clinton; least monthly, 3.12, at Shreveport.

Wind.—Prevailing direction, south.—*R. E. Kerkam, Sergeant, Signal Corps, New Orleans, in charge.*

MICHIGAN.

The notable features of the month were the hot wave of the last seven days and the heavy local rainfalls.

Temperature.—The mean was 3.2 above the normal of the last fifteen years; highest monthly mean, 75.3, at Bangor; lowest monthly mean, 59.3, at Atlantic; maximum, 100, at Bangor, 28th; minimum, 31, at Roscommon, 8th; greatest local monthly range, 65, at Ivan; least local monthly range, 36, at Atlantic; greatest daily range, 48, at Grayling, 8th; least daily range, 4, at Grand Haven, 6th, and at Saint Ignace, 15th.

Precipitation.—The average was 0.34 below the normal of the last fifteen years; greatest monthly, 6.30, at Otsego; least monthly, 1.75, at Gaylord.

Wind.—Prevailing direction, southwest.—*N. B. Conger, Sergeant, Signal Corps, Lansing, director.*

MINNESOTA.

Temperature.—The temperature was 2 to 3 above the normal over the greater portion of the state, and in the northwestern counties the excess was about 7. In the vicinity of Lake Superior it was slightly below the normal; highest monthly mean, 71.3, at La Crosse, Wis.; lowest monthly mean, 57.5, at Duluth; maximum, 100, at Grand Meadow, 28th; minimum, 37, at Leech Lake, 7th; greatest local monthly range, 57, at Leech Lake; least local monthly range, 38, at Farmington and Rolling Green; greatest daily range, 48, at Saint Vincent, 7th; least daily range, 4, at Saint Vincent, 21st.

Precipitation.—In the southeastern portion of the state the rainfall exceeded that of any June during the last 18 years; greatest monthly, 13.05, at Redwood Falls; least monthly, 2.56, at Pine River Dam.

Wind.—Prevailing direction, southeast.—*John Healy, Corporal, Signal Corps, Saint Paul, in charge.*

MISSOURI.

Temperature.—Highest monthly mean, 79.9, at Miami; lowest monthly mean, 70.9, at Kirksville; maximum, 105, at Miami; minimum, 50.0, at Oregon and Kansas City.

Precipitation.—The rainfall was very irregular throughout the state, and there was no general rain during the month; greatest monthly, 4.58, at Kirksville; least monthly, 0.37, at Lamonte.—*Prof. Francis E. Nipher, Saint Louis, director.*

METEOROLOGICAL REPORT OF THE MISSOURI STATE BOARD OF AGRICULTURE.

The month has been remarkable for high temperature and small rainfall.

Temperature.—The mean temperature was 3.5 above the normal; highest monthly mean, 83.7, at Liberty; lowest monthly mean, 73.8, at Cassville; maximum, 106, at Proteau, 26th, and Eldon, 30th; minimum, 44, at Glenwood, 6th; greatest local monthly range, 55, at Excelsior; least local monthly range, 30, at Windsor.

Precipitation.—The average was 3.00 below the normal; greatest monthly, 7.47, at Princeton; least monthly, 0.37, at Lamonte.

Wind.—Prevailing direction, south.—*Levi Chubbuck, Secretary of State Board of Agriculture, Columbia, director; A. L. McRae, Sergeant, Signal Corps, assistant.*

NEBRASKA.

The features of the month were the extremes in temperature and precipitation.

Temperature.—The mean was about 5 above the normal; maximum, 108, at Ansley and Thedford; minimum, 32, at Alliance. A light frost was reported in connection with this minimum, but no damage has been reported.

Precipitation.—In the extreme western part of the state less than 1.00 fell, from there eastward the amount increased irregularly to the Missouri River. The greater part of the state received 3.00 or 4.00, although a limited region on the upper Niobrara received about 8. The greatest rainfall occurred in an area stretching east from Tekamah, where 18.70 fell.—*Prof. Goodwin D. Sweeney, Crete, director; G. A. Loveland, Sergeant, Signal Corps, assistant.*

NEVADA.

The month has been one of the coolest and driest on record.

Temperature.—The mean was 4.1 below the normal; highest monthly mean, 84.5, at El Dorado Canyon; lowest monthly mean, 51.8, at Ruby Hill; maximum, 109, at El Dorado Canyon, 29th; minimum, 24, at Ruby Hill, 3d, and at Ely, 2d.

Precipitation.—The precipitation was the least on record for the state; the only portion in which precipitation fell was in the eastern and northern counties, where light amounts were reported on the last days of the month. A snowfall of 3.00 was reported at Ruby Hill, and 1.00 at Tuscarora.

Wind.—Prevailing direction, south.—*Prof. Chas. W. Friend, Carson City, director; H. E. Wilkinson, Corporal, Signal Corps, assistant.*

NEW ENGLAND METEOROLOGICAL SOCIETY.

Temperature.—The average was 1.8 below the normal; highest monthly mean, 68.7, at Northampton; lowest monthly mean, 54.0, at Eastport; maximum, 94, at Westborough, 24th; minimum, 26, at Berlin Falls, 3d; greatest local monthly range, 60, at Berlin Falls; least local monthly range, 26, at Nantucket; greatest daily range, 53, at Berlin Mills, 11th; least daily range, 0, at Walpole, 12th.

Precipitation.—The average was 0.24 below the normal; greatest monthly, 6.46, at West Milan; least monthly, 1.35, at Block Island.

Wind.—Prevailing direction, northwest.—*Prof. William H. Niles, Boston, Mass., president; Prof. Winslow Upton, Providence, R. I., secretary; J. Warren Smith, Private, Signal Corps, assistant.*

NEW JERSEY.

Temperature.—The mean was 1.3 above the normal; highest monthly mean, 70.6, at Trenton; lowest monthly mean, 67.0, at Allaire; maximum, 95, at Woodbury and Imlaystown, 5th; minimum, 42, at Gillette, 30th; greatest local monthly range, 48, at Gillette; least local monthly range, 30, at Bridgeton, Readington, Trenton, and Union; greatest daily range, 48, at Readington, 30th; least daily range, 3, at Ocean City, 16th.

Precipitation.—The average was 0.39 below the normal; greatest monthly, 5.16, at Tenny; least monthly, 0.99, at Bridgeton.

Wind.—Prevailing direction, southwest.—*E. W. McGann, Sergeant, Signal Corps, New Brunswick, in charge.*

NEW YORK.

Temperature.—Highest monthly mean, 71.5, at Eden Centre; lowest monthly mean, 58.5, at Keene Valley; maximum, 97, at Eden Centre, 30th; minimum, 30, at Sherman, 8th; greatest local monthly range, 64, at Kendall; least local monthly range, 92, at Brooklyn; greatest daily range, 46, at Keene Valley, 30th; least daily range, 3, at Palermo, 7th.

Precipitation.—Greatest monthly, 6.93, at Pendleton Centre; least monthly, 2.10, at Watervleit Arsenal.

Wind.—Prevailing direction, southwest.—*Prof. E. A. Fuytes, Ithaca, director; I. G. Gardiner, Corporal, Signal Corps, assistant.*

NORTH CAROLINA.

Temperature.—The mean was 3 below the normal; highest monthly mean, 82.4, at Fayetteville; lowest monthly mean, 66.6, at Highlands; maximum, 102, at Chapel Hill, 29th; minimum, 40, at Franklin, 8th; greatest local monthly range, 54, at Douglas; least local monthly range, 23, at Hatteras.

Precipitation.—The average was 1.65 below the normal; greatest monthly, 6.93, at Washington; least monthly, 0.52, at Charlotte.

Wind.—Prevailing direction, southwest.—*Dr. Herbert B. Battle, Raleigh, director; C. F. von Herrmann, Sergeant, Signal Corps, assistant.*

NORTH AND SOUTH DAKOTA.

Temperature.—The mean was about 4 above the normal; highest monthly mean, 72.5, at Wahpeton, N. Dak.; lowest monthly mean, 65.1, at Fort Buford, N. Dak.; maximum, 99, at Fort Sully and Rapid City, S. Dak., 25th, and at Grand Forks, N. Dak., and Woonsocket, S. Dak., 28th; minimum, 30, at Aberdeen, S. Dak., 7th; greatest local monthly range, 60, at Highmore, S. Dak.; least local monthly range, 40, at Sioux Falls, S. Dak.

Precipitation.—The average was about 1.93 above the normal; greatest monthly, 10.53, at Millbank, S. Dak.; least monthly, 2.19, at Vermillion.

Wind.—Prevailing direction, southeast.—*S. W. Glenn, Sergeant, Signal Corps, Huron, S. Dak., in charge.*

OHIO.

June was marked by unusually warm weather and excessive rainfall.

Temperature.—The mean was 3.8 above the normal; maximum, 101, at Wapakoneta, 28th; minimum, 39, at Wauseon, 8th; greatest daily range, 42, at Logan, 3d; least daily range, 7, at Sandusky, 27th.

Precipitation.—The rainfall was well distributed throughout the month, and is the largest on record in this bureau for June. The average was 0.65 above the normal; greatest monthly, 8.72, at Newcomerstown.

Wind.—Prevailing direction, southwest.—*Prof. B. F. Thomas, Columbus, director; Lieut. Charles E. Kilbourne, secretary; C. M. Strong, Corporal, Signal Corps, assistant.*

OREGON.

Temperature.—The mean was 2.2 below the normal; maximum, 103, at Grant's Pass, 29th; minimum, 25, at Beulah, 2d.

Precipitation.—The precipitation was generally above the average; the greatest amount, 6.40 was reported from the Cascades, and less than one inch was reported south of the Blue Mountains.

Wind.—Prevailing direction, west.—*Hon. H. E. Hayes, Master State Grange, Oswego, director; B. S. Pague, Sergeant, Signal Corps, assistant.*

PENNSYLVANIA.

Temperature.—The mean was 2 above the normal; highest monthly mean, 73.7, at Uniontown and Huntingdon; lowest monthly mean, 64.2, at Dyberry; maximum, 97, at Carlisle, 6th, and at Lynnport, 30th; minimum, 33, at Charlesville, 14th; greatest local monthly range, 81.3, at Wilkes Barre; least local monthly range, 14, at Erie; greatest daily range, 47, at Lock Haven, 25th; least daily range, 2, at Wellsborough, 21st.

Precipitation.—The average was nearly 0.50 inch below the normal; greatest monthly, 5.74, at Forks of Neshaminy; least monthly, 1.30, at Philadelphia.

Wind.—Prevailing direction, west.—*Under direction of the Franklin Institute, Philadelphia; T. F. Townsend, Sergeant, Signal Corps, assistant.*

SOUTH CAROLINA.

Temperature.—Highest monthly mean, 84.8, at Spartanburgh; lowest monthly mean, 76.6, at Walhalla; maximum, 103, at Cheraw, 29th; minimum, 56, at Spartanburgh, 3d; greatest local monthly range, 43, at Spartanburgh; least local monthly range, 20, at Walhalla.

Precipitation.—The average was about 1.38 below the normal; greatest monthly, 4.27, at Batesburgh; least monthly, 0.78, at Greenwood.

Wind.—Prevailing direction, southwest.—*Hon. A. P. Butler, Columbia, director; G. E. Hunt, Sergeant, Signal Corps, assistant.*

TENNESSEE.

Temperature.—Highest monthly mean, 81, at McKenzie, Woodstock, and Memphis; lowest monthly mean, 73, at Greeneville; maximum, 102, at Hohenwald, 29th, and at Watkins, 30th; minimum, 56, at Rugby, 7th, and at Jacksboro, 8th; greatest local monthly range, 44, at Hohenwald; least local monthly range, 25, at McKenzie and Covington; greatest daily range, 31, at Hohenwald, 1st; least daily range, 3, at Florence Station, Lewisburgh, and Nunnally, 5th, and at Jacksboro, 23d.

Precipitation.—The average was, with one exception (in 1887), the smallest June rainfall during the last eight years; greatest monthly, 8.36, at Dunlap; least monthly, 0.69, at Kingston.

Wind.—Prevailing direction, southwest.—*J. D. Plunket, M. D., Nashville, director; H. C. Bate, Signal Corps, assistant.*

TEXAS.

Temperature.—The mean varied slightly from the normal in all parts of the state; highest monthly mean, 83.6, at Rio Grande City; lowest monthly mean, 74.4, at Fort Elliott; maximum, 103, at Haskell and Mesquite, 30th; minimum, 38, at Hartley, 8th; greatest local monthly range, 59, at Hartley; least local monthly range, 25, at Galveston.

Precipitation.—Along the coast and over the eastern portion of the state it was generally normal, except in some localities where it was excessive, over other parts of the state it was below the normal, and none fell north of the 32d parallel and west of the 99th meridian; greatest monthly, 7.42, at Galveston; least monthly, 0.00, at Haskell.—*D. D. Bryan, Galveston, director; I. M. Cline, Sergeant, Signal Corps, assistant.*

Meteorological record of Army post surgeons, voluntary, and other co-operating observers, June, 1890.

Meteorological record of voluntary observers, &c.—Continued.

| Stations. | Temperature. (Fahrenheit.) | | | Precip'n. | Stations. | Temperature. (Fahrenheit.) | | | Precip'n. |
|---------------------------|-------------------------------|-------|-------|-------------|---------------------------|-------------------------------|-------|------|-------------|
| | Max. | Min. | Mean | | | Max. | Min. | Mean | |
| <i>California—Cont'd.</i> | 0 | 0 | 0 | <i>Ins.</i> | <i>California—Cont'd.</i> | 0 | 0 | 0 | <i>Ins.</i> |
| Aptos*..... | 78 | 45 | 61.9 | 0.00 | Pomona*..... | 96 | 55 | 68.5 | 0.00 |
| Arch Beach*..... | 90 | 54 | 66.2 | 0.00 | Presidio of S. F..... | 75 | 42 | 55.5 | 0.08 |
| Athlone*..... | 102 | 57 | 75.5 | 0.00 | Puente*..... | 106 | 59 | 72.3 | 0.00 |
| Auburn*..... | 93 | 54 | 68.5 | 0.00 | Ravenna*..... | 101 | 50 | 68.5 | 0.00 |
| Bakersfield*..... | 103 | 52 | 81.5 | 0.00 | Red Bluff*..... | 103 | 54 | 67.0 | 0.00 |
| Banning*..... | 100 | 58 | 78.5 | 0.00 | Redding*..... | 108 | 48 | 71.3 | 0.00 |
| Barstow*..... | 104 | 48 | 75.5 | 0.00 | Riverside*..... | 108 | 44 | 67.1 | 0.00 |
| Belmont*..... | 88 | 54 | 67.2 | 0.00 | Rocklin*..... | 102 | 54 | 73.2 | 0.00 |
| Benicia Barracks..... | 92 | 47 | 64.7 | T. | Rumsey*..... | 102 | 62 | 81.3 | 0.00 |
| Berendo*..... | 104 | 60 | 76.2 | 0.00 | Sacramento (1)..... | 89 | 41 | 64.4 | 0.00 |
| Berkeley*..... | 82 | 46 | 58.8 | 0.00 | Sacramento (2)*..... | 88 | 59 | 70.3 | 0.00 |
| Bishop Creek*..... | 104 | 58 | 87.0 | 0.00 | Salinas (1)*..... | 72 | 51 | 57.4 | 0.00 |
| Borden*..... | 110 | 55 | 76.3 | 0.00 | Salinas (2)*..... | 67 | 50 | 58.8 | 0.00 |
| Boulder Creek*..... | 98 | 40 | 63.7 | 0.00 | Salton*..... | 109 | 65 | 88.6 | 0.00 |
| Brighton*..... | 91 | 58 | 71.6 | 0.00 | Sanger Junction*..... | 108 | 59 | 81.2 | 0.00 |
| Byron*..... | 94 | 60 | 76.7 | 0.00 | San Ardo*..... | 100 | 46 | 68.7 | 0.00 |
| Caliente*..... | 100 | 60 | 77.0 | 0.00 | San Diego Bks..... | 90 | 51 | 66.0 | 0.00 |
| Calistoga*..... | 95 | 50 | 69.1 | 0.00 | San Gabriel*..... | 106 | 61 | 76.5 | 0.00 |
| Castroville*..... | 72 | 50 | 59.2 | 0.00 | San Jose*..... | 90 | 53 | 63.6 | 0.00 |
| Centerville*..... | 94 | 54 | 67.0 | 0.00 | San Mateo*..... | 84 | 50 | 59.3 | 0.00 |
| Chico*..... | 104 | 53 | 71.3 | 0.00 | San Miguel*..... | 98 | 52 | 66.1 | 0.00 |
| Cisco*..... | 80 | 31 | 51.5 | 0.30 | San Pedro*..... | 96 | 58 | 68.2 | 0.00 |
| Colfax*..... | 96 | 44 | 67.0 | 0.00 | Santa Ana*..... | 104 | 58 | 70.7 | 0.00 |
| Colton*..... | 106 | 56 | 74.0 | 0.00 | Santa Barbara (1)..... | 93 | 45 | 62.4 | 0.06 |
| Corning*..... | 104 | 59 | 77.5 | 0.00 | Santa Clara*..... | 87 | 42 | 60.8 | 0.00 |
| Crescent City..... | ..... | ..... | 3.27 | 0.00 | Santa Cruz (1)*..... | 84 | 47 | 61.9 | 0.00 |
| Davisville*..... | 98 | 50 | 68.1 | 0.00 | Santa Cruz (2)*..... | 78 | 42 | 64.3 | 0.00 |
| Delano*..... | 105 | 58 | 78.2 | 0.00 | Santa Margarita*..... | 98 | 46 | 63.1 | 0.00 |
| Delta*..... | 102 | 52 | 70.3 | 0.00 | Santa Monica*..... | 99 | 60 | 69.7 | 0.00 |
| Downey*..... | 99 | 59 | 69.8 | 0.00 | Santa Paula*..... | 92 | 41 | 73.9 | 0.00 |
| Dunnigan*..... | 108 | 56 | 79.0 | 0.00 | Santa Rosa*..... | 86 | 41 | 65.0 | 0.00 |
| Dunsmuir*..... | 96 | 42 | 64.6 | 0.40 | Selma*..... | 100 | 60 | 72.9 | 0.00 |
| Edgewood*..... | 91 | 45 | 63.7 | 1.72 | Seven Palms*..... | 115 | 65 | 89.0 | 0.00 |
| El Dorado*..... | 101 | 54 | 72.0 | 0.00 | Shingle Springs*..... | 99 | 55 | 75.6 | 0.00 |
| Elmira*..... | 100 | 58 | 71.6 | 0.00 | Sims*..... | 100 | 40 | 65.5 | 0.65 |
| El Verano*..... | 92 | 54 | 66.5 | 0.00 | Soledad*..... | 86 | 50 | 63.1 | 0.00 |
| Emigrant Gap*..... | 85 | 34 | 56.6 | 0.00 | Sonoma*..... | 88 | 48 | 63.2 | T. |
| Esparto*..... | 102 | 55 | 77.1 | 0.00 | Soquel*..... | 84 | 48 | 66.5 | 0.00 |
| Evergreen*..... | ..... | ..... | 0.00 | 0.00 | South Vallejo*..... | 78 | 46 | 54.5 | 0.00 |
| Farmington*..... | 99 | 53 | 71.2 | 0.00 | Spadra*..... | 106 | 57 | 73.0 | 0.00 |
| Felton*..... | 98 | 48 | 69.0 | 0.00 | Steeles*..... | 87 | 45 | 60.3 | 0.00 |
| Fernando*..... | 106 | 52 | 73.8 | 0.00 | Stockton (2)*..... | 90 | 50 | 70.9 | 0.00 |
| Florence*..... | 92 | 55 | 69.8 | 0.00 | Suisun City*..... | 99 | 50 | 66.3 | 0.00 |
| Folsom*..... | 100 | 58 | 71.1 | 0.00 | Susanville*..... | 88 | 42 | 61.6 | 0.14 |
| Fort Bidwell*..... | 91 | 33 | 58.6 | 0.33 | Tehachapi*..... | 87 | 40 | 66.6 | 0.00 |
| Fort Gaston*..... | 105 | 41 | 64.8 | 0.40 | Tehama*..... | 96 | 59 | 72.9 | 0.00 |
| Fort Mason*..... | 72 | 45 | 56.9 | 0.06 | Templeton*..... | 105 | 52 | 69.1 | 0.00 |
| Galt*..... | 100 | 50 | 75.5 | 0.00 | Towles*..... | 92 | 44 | 65.9 | 0.00 |
| Georgetown*..... | 89 | 38 | 63.4 | 0.10 | Tracy*..... | 94 | 56 | 73.0 | 0.00 |
| Gilroy*..... | 93 | 53 | 65.2 | 0.00 | Traver*..... | 102 | 60 | 80.5 | 0.00 |
| Girard*..... | 93 | 45 | 64.5 | 0.00 | Tropico*..... | 104 | 58 | 71.4 | 0.00 |
| Glen Ellen*..... | 95 | 49 | 65.5 | 0.00 | Truckee*..... | 86 | 35 | 59.4 | 0.00 |
| Goshen*..... | 100 | 55 | 76.5 | 0.00 | Tulare*..... | 105 | 58 | 78.5 | 0.00 |
| Grass Valley*..... | ..... | ..... | 0.06 | 0.06 | Turlock*..... | 98 | 58 | 75.4 | 0.00 |
| Haywards*..... | 84 | 54 | 61.6 | 0.00 | Upper Mattole*..... | 94 | 40 | 61.0 | 0.74 |
| Hollister*..... | 89 | 50 | 66.0 | 0.00 | Vacaville (1)*..... | 97 | 55 | 70.4 | 0.00 |
| Hornbrook*..... | 98 | 40 | 62.9 | 0.60 | Vacaville (2)*..... | 97 | 57 | 71.9 | 0.00 |
| Hydesville*..... | 78 | 39 | 56.3 | 0.67 | Valley Springs*..... | 96 | 50 | 71.0 | 0.00 |
| Indio*..... | 111 | 65 | 88.3 | 0.00 | Vina*..... | 104 | 58 | 76.8 | 0.00 |
| Ione*..... | 98 | 52 | 68.6 | 0.00 | Volcano Springs*..... | 118 | 75 | 95.7 | 0.00 |
| Iowa Hill*..... | 94 | 47 | 67.1 | 0.08 | Volta*..... | 102 | 54 | 70.8 | 0.00 |
| Jolon*..... | 56 | 70.3 | 0.00 | 0.00 | Walla Walla Ck..... | 94 | 32 | 59.8 | 0.28 |
| Keeler*..... | 98 | 58 | 81.4 | 0.00 | Westley*..... | 94 | 60 | 77.3 | 0.00 |
| Keene*..... | 95 | 47 | 70.2 | 0.00 | Wheatland*..... | 98 | 45 | 69.4 | 0.00 |
| Kingsburg*..... | 102 | 56 | 75.9 | 0.00 | Whittier*..... | 106 | 53 | 70.3 | 0.00 |
| King City*..... | 92 | 48 | 64.1 | 0.00 | Williams*..... | 100 | 58 | 74.8 | 0.00 |
| Knight's Landing*..... | 90 | 58 | 70.5 | 0.00 | Willow (1)*..... | 101 | 43 | 71.5 | 0.20 |
| La Grange*..... | 104 | 47 | 71.6 | 0.00 | Willow (2)*..... | 105 | 32 | 69.6 | 0.00 |
| Lathrop*..... | 98 | 58 | 75.4 | 0.00 | Woodland*..... | 91 | 52 | 70.7 | 0.00 |
| Lemoore*..... | 94 | 49 | 65.2 | 0.00 | <i>Colorado.</i> | | | | |
| Lemoore*..... | 105 | 55 | 76.1 | 0.00 | Abbott*..... | ..... | ..... | 1.00 | 0.00 |
| Lewistown*..... | 1019 | 539 | 75.99 | 0.00 | Agate*..... | 100 | 66 | 77.0 | 0.62 |
| Livermore*..... | 94 | 47 | 61.0 | 0.00 | Alma*..... | 73 | 21 | 49.9 | 0.07 |
| Livingston*..... | 102 | 55 | 76.3 | 0.00 | Amherst*..... | ..... | ..... | 3.41 | 0.00 |
| Los Angeles*..... | 106 | 55 | 71.5 | 0.00 | Apishapa*..... | 99 | 48 | 68.5 | 0.11 |
| Los Gatos (2)*..... | ..... | ..... | 0.00 | 0.00 | Aroya*..... | ..... | ..... | 0.43 | 0.00 |
| Mammoth Tank*..... | 112 | 72 | 88.7 | 0.00 | Bennet*..... | 108 | 45 | 57.4 | 0.00 |
| Martinez*..... | 90 | 54 | 70.7 | 0.00 | Box Elder*..... | ..... | ..... | 0.80 | 0.00 |
| Marysville*..... | 90 | 60 | 69.9 | 0.10 | Brandon*..... | ..... | ..... | 0.66 | 0.00 |
| Menlo Park*..... | 92 | 52 | 63.7 | 0.00 | Breckenridge*..... | 83 | 12 | 47.6 | 0.25 |
| Merced*..... | 98 | 58 | 73.0 | 0.00 | Byers*..... | 102 | 48 | 83.5 | 0.00 |
| Modesto*..... | 96 | 58 | 74.3 | 0.00 | Canon City*..... | 98 | 42 | 70.6 | 0.73 |
| Mojave*..... | 105 | 55 | 76.6 | 0.00 | Castle Rock*..... | 96 | 29 | 64.0 | 0.10 |
| Montague*..... | 104 | 40 | 66.2 | 1.15 | Cheyenne Wells*..... | 95 | 45 | 70.2 | 0.00 |
| Monterey (H. d. M)*..... | 78 | 48 | 58.6 | 0.00 | Chromo*..... | ..... | ..... | 0.26 | 0.00 |
| Mount Hamilton*..... | 80 | 48 | 59.5 | 0.00 | Climax*..... | 65 | 18 | 44.8 | 0.68 |
| Napa*..... | 82 | 32 | 57.6 | 0.00 | Crook*..... | ..... | ..... | 1.93 | 0.00 |
| National City*..... | 94 | 52 | 65.5 | 0.00 | Cumbres*..... | 70 | 33 | 50.4 | 0.39 |
| Newark*..... | 100 | 41 | 66.4 | 0.00 | Deer Trail*..... | 99 | 38 | 65.8 | 0.74 |
| Newhall*..... | 90 | 50 | 66.0 | 0.00 | Delta*..... | 96 | 45 | 69.4 | 0.07 |
| Newman*..... | 106 | 30 | 65.9 | 0.00 | Durango (1)*..... | 104 | ..... | 0.40 | 0.00 |
| Niles*..... | 98 | 56 | 76.2 | 0.00 | Eagle Farm*..... | ..... | ..... | 0.90 | 0.00 |
| Norwalk*..... | 96 | 55 | 70.9 | 0.00 | Elkhorn*..... | ..... | ..... | 0.03 | 0.00 |
| Oakland (1)*..... | 110 | 55 | 73.5 | 0.03 | First View*..... | 100 | 48 | 73.0 | 1.60 |
| Oakland (2)*..... | 81 | 45 | 59.5 | T. | Fort Crawford*..... | 84 | 34 | 61.8 | 0.02 |
| Ogilby*..... | 74 | 50 | 60.7 | 0.00 | Fort Lewis*..... | 81 | 24 | 55.8 | 0.45 |
| Ontario*..... | 116 | 74 | 93.5 | 0.00 | Fort Logan*..... | 96 | 35 | 66.8 | 0.05 |
| Oroville*..... | 109 | 50 | 75.2 | 0.00 | Fort Morgan*..... | ..... | ..... | 0.37 | 0.00 |
| Pajaro*..... | 99 | 54 | 74.7 | 0.45 | Fruits*..... | 99 | 38 | 72.2 | T. |
| Pasadena*..... | 74 | 48 | 59.1 | 0.00 | Georgetown*..... | 81 | 30 | 58.5 | 0.32 |
| Paso Robles*..... | 100 | 41 | ..... | 0.05 | Greenhorn*..... | 89 | 41 | 65.6 | 0.42 |
| Petaluma*..... | 96 | 49 | 68.9 | 0.00 | Gunnison*..... | 83 | 25 | 52.7 | 0.00 |
| Placerville (1)*..... | 94 | 53 | 64.3 | 0.00 | Hugo*..... | 95 | 45 | 70.2 | 0.00 |
| Placerville (2)*..... | 93 | 48 | 62.8 | 0.00 | Husted*..... | 95 | 34 | 64.2 | 0.61 |
| | | | | | Julesburg*..... | 102 | 39 | 70.8 | 1.72 |

Meteorological record of voluntary observers, &c.—Continued.

| Stations. | Temperature. (Fahrenheit.) | | | Precip'n. | Stations. | Temperature. (Fahrenheit.) | | | Precip'n. |
|------------------------------|-------------------------------|------|-------|-------------|------------------------|-------------------------------|------|-------|-------------|
| | Max. | Min. | Mean. | | | Max. | Min. | Mean. | |
| <i>Colorado—Cont'd.</i> | | | | <i>Ins.</i> | <i>Georgia—Cont'd.</i> | | | | <i>Ins.</i> |
| Kirk | 95 | 56 | 73.6 | 1.37 | Smithville | 100 | 64 | 80.2 | 4.09 |
| Kit Carson | 95 | 56 | 73.6 | 0.93 | Thomasville (2) | 100 | 65 | 80.4 | 4.52 |
| Laird | 103 | 47 | 74.5 | 1.20 | Toccoa | 97 | 60 | 77.8 | 1.75 |
| Lamar | 103 | 47 | 74.5 | 1.57 | Union Point | 100 | 60 | 79.8 | 1.75 |
| Las Animas | 101 | 41 | 72.2 | 0.05 | Washington | 98 | 60 | 81.6 | 3.31 |
| La Veta | 71 | 30 | 43.8 | 1.13 | Way Cross | 98 | 65 | 81.6 | 3.10 |
| Leadville | 100 | 43 | 65.1 | 1.96 | Waynesborough | 97 | 72 | 82.6 | 4.35 |
| Le Roy | 105 | 45 | 66.4 | 0.02 | West Point | 95 | 58 | 76.8 | |
| Livermore | 78 | 28 | 54.4 | 0.04 | Woolley's Ford | 91 | 34 | 60.6 | 0.52 |
| Magnolia | 81 | 40 | 62.4 | 0.16 | <i>Idaho.</i> | | | | |
| Middle Box Elder | 73 | 24 | 49.9 | 0.77 | American Falls | 91 | 34 | 60.6 | 0.52 |
| Morraine | 73 | 24 | 49.9 | 0.77 | Boise Barracks | 98 | 36 | 62.9 | 0.67 |
| Morrison | 73 | 24 | 49.9 | 0.77 | Bonanza | 80 | 24 | 48.0 | 0.31 |
| Peyton | 73 | 24 | 49.9 | 0.77 | Erma | 84 | 24 | 53.1 | 0.28 |
| Ranch near Como | 73 | 24 | 49.9 | 0.77 | Fort Sherman | 92 | 40 | 60.6 | 1.00 |
| Red Cliff | 103 | 43 | 72.1 | 0.77 | Henry's Lake | 72 | 38 | 55.0 | 7.90 |
| River Bend | 103 | 43 | 72.1 | 0.77 | Kootenai | 92 | 47 | 59.9 | 3.07 |
| Rocky Ford | 103 | 43 | 72.1 | 0.77 | Lewiston | 101 | 46 | 65.5 | 2.36 |
| Sanborn | 86 | 29 | 58.2 | 0.87 | Mullan | 88 | 35 | 51.6 | 3.82 |
| San Luis Ex. Sta. | 86 | 29 | 58.2 | 0.87 | Payette | 99 | 31 | 64.5 | 0.48 |
| Sedgwick | 86 | 29 | 58.2 | 0.87 | Soda Springs | 88 | 28 | 54.1 | 1.08 |
| Sheridan Lake | 86 | 29 | 58.2 | 0.87 | <i>Illinois.</i> | | | | |
| Springfield | 85 | 17 | 53.2 | 0.07 | Aurora (1) | 96 | 40 | 71.6 | 6.97 |
| Sunnyside | 85 | 17 | 53.2 | 0.07 | Aurora (2) | 99 | 42 | 73.8 | 6.04 |
| Stamford | 100 | 33 | 66.8 | 0.07 | Beardstown | 98 | 48 | 74.3 | 3.70 |
| Sterling | 92 | 39 | 66.8 | 0.07 | Beason | 95 | 51 | 70.7 | 8.46 |
| T. S. Ranch | 94 | 33 | 62.8 | 0.54 | Belvidere | 96 | 53 | 77.5 | 6.75 |
| Thon | 94 | 33 | 62.8 | 0.54 | Charleston | 96 | 53 | 77.5 | 3.56 |
| Upper Pine | 94 | 33 | 62.8 | 0.54 | Collinsville | 99 | 59 | 73.4 | 13.57 |
| Vilas | 94 | 33 | 62.8 | 0.54 | Cockrell | 101 | 44 | 75.8 | 7.38 |
| Waterville | 94 | 33 | 62.8 | 0.54 | Dwight | 99 | 59 | 73.4 | 13.57 |
| Watkins | 94 | 33 | 62.8 | 0.54 | East Peoria | 104 | 62 | 78.8 | 7.38 |
| Westlife | 94 | 33 | 62.8 | 0.54 | Flora | 96 | 53 | 78.5 | 2.45 |
| Way | 94 | 33 | 62.8 | 0.54 | Fort Sheridan | 96 | 41 | 69.4 | 7.77 |
| Yuma | 94 | 33 | 62.8 | 0.54 | Golconda | 96 | 63 | 79.4 | 2.17 |
| <i>Connecticut.</i> | | | | | Grand Tower | 100 | 49 | 77.6 | 2.40 |
| Canton | 88 | 43 | 67.8 | 3.42 | Greenville | 90 | 52 | 74.8 | 5.32 |
| Colechester | 85 | 42 | 65.1 | 3.24 | Hennepin | 97 | 42 | 73.5 | 3.98 |
| Falls Village | 92 | 47 | 67.4 | 2.46 | Irishtown | 96 | 54 | 78.0 | 3.08 |
| Fort Trumbull | 92 | 47 | 67.4 | 2.46 | Jordan's Grove | 96 | 54 | 78.0 | 3.08 |
| Hartford (2) | 92 | 47 | 67.4 | 2.46 | Lacon | 98 | 57 | 75.6 | 3.94 |
| Lake Konomoc | 92 | 47 | 67.4 | 2.46 | Lake Forest | 94 | 44 | 69.4 | 5.39 |
| Lebanon | 92 | 47 | 67.4 | 2.46 | Lanark | 94 | 53 | 71.2 | 12.32 |
| Massfield | 92 | 47 | 67.4 | 2.46 | Louisville | 96 | 54 | 76.9 | 3.72 |
| Middletown | 92 | 47 | 67.4 | 2.46 | Martinsville | 98 | 60 | 75.0 | 3.08 |
| New Hartford (1) | 92 | 47 | 67.4 | 2.46 | Mascoutah | 99 | 56 | 75.0 | 3.08 |
| North Woodstock | 92 | 47 | 67.4 | 2.46 | Mattoon | 101 | 58 | 79.3 | 2.10 |
| Shelton | 92 | 47 | 67.4 | 2.46 | McLeansborough | 102 | 56 | 79.3 | 2.10 |
| South Manchester | 92 | 47 | 67.4 | 2.46 | Mount Carmel | 98 | 56 | 78.3 | 3.57 |
| Thompson | 92 | 47 | 67.4 | 2.46 | Olney | 98 | 56 | 78.3 | 3.57 |
| Uncasville | 92 | 47 | 67.4 | 2.46 | Oswego | 98 | 56 | 78.3 | 3.57 |
| Voluntown | 92 | 47 | 67.4 | 2.46 | Ottawa | 98 | 44 | 76.0 | 6.87 |
| Wallingford | 92 | 47 | 67.4 | 2.46 | Palestine | 96 | 54 | 73.0 | 2.58 |
| Waterbury | 92 | 47 | 67.4 | 2.46 | Pana | 96 | 63 | 79.5 | 5.25 |
| West Simsbury | 92 | 47 | 67.4 | 2.46 | Peoria (1) | 100 | 57 | 78.9 | 2.42 |
| <i>Delaware.</i> | | | | | Peoria (2) | 100 | 57 | 78.9 | 2.42 |
| Kirkwood | 64 | 74.3 | | | Philo | 100 | 52 | 77.4 | 5.14 |
| <i>District of Columbia.</i> | | | | | Pontiac | 104 | 44 | 75.1 | 5.10 |
| Washington Bks. | 94 | 48 | 74.8 | 1.60 | Riley | 91 | 44 | 70.0 | 5.64 |
| <i>Florida.</i> | | | | | Rockford | 95 | 46 | 72.0 | 12.33 |
| Altamonte Springs | 97 | 58 | 81.4 | 6.20 | Rock Island Arl. | 96 | 40 | 68.4 | 5.28 |
| Alva | 96 | 67 | 78.7 | 7.23 | Rushville | 100 | 54 | 75.8 | 7.54 |
| Fort Barrancas | 95 | 68 | 81.5 | 4.96 | Sycamore | 95 | 50 | 71.5 | 7.98 |
| Fort Meade | 91 | 72 | 76.0 | 3.94 | Warsaw | 95 | 50 | 71.5 | 7.98 |
| Homeland | 96 | 72 | 81.6 | 4.95 | Watseka | 90 | 42 | 74.3 | 5.78 |
| Hypoluxo | 74 | 81.2 | 3.66 | | White Hall | 96 | 57 | 80.2 | 3.81 |
| Lake City | 99 | 64 | 80.8 | 6.95 | Winnebago | 99 | 54 | 74.4 | 10.15 |
| Madison | 95 | 73 | 80.0 | 7.23 | <i>Indiana.</i> | | | | |
| Manatee | 95 | 65 | 81.8 | 7.72 | Angola | 98 | 60 | 80.1 | 2.26 |
| Matanzas | 95 | 70 | 79.3 | 4.17 | Bullerville | 98 | 60 | 74.0 | 5.01 |
| Merritt's Island | 96 | 70 | 83.4 | 5.45 | Cannelton | 100 | 55 | 75.2 | 2.91 |
| Pine Level | 66 | 77.6 | 6.54 | | Columbia City | 93 | 58 | 75.1 | 4.80 |
| St. Francis Bks. | 95 | 66 | 80.6 | 6.55 | Columbus | 96 | 56 | 75.7 | 5.23 |
| San Antonio | 95 | 66 | 79.9 | 3.20 | Connersville | 93 | 58 | 75.1 | 4.80 |
| Tallahassee | 93 | 70 | 79.6 | 5.15 | De Gonia Springs | 93 | 60 | 79.2 | 3.07 |
| Villa City | 97 | 70 | 79.3 | 0.04 | Delphi | 96 | 40 | 70.0 | 3.97 |
| <i>Georgia.</i> | | | | | Evansville | 96 | 56 | 75.9 | 4.60 |
| Altamonte Springs | 97 | 58 | 81.4 | 6.20 | Farmland | 96 | 56 | 75.9 | 4.60 |
| Alva | 96 | 67 | 78.7 | 7.23 | Franklin | 97 | 57 | 77.6 | 3.96 |
| Fort Barrancas | 95 | 68 | 81.5 | 4.96 | Huntingburgh | 104 | 68 | 82.3 | 10.89 |
| Fort Meade | 91 | 72 | 76.0 | 3.94 | Huntington | 96 | 59 | 76.0 | 6.04 |
| Homeland | 96 | 72 | 81.6 | 4.95 | Jeffersonville | 96 | 59 | 76.0 | 6.04 |
| Hypoluxo | 74 | 81.2 | 3.66 | | La Fayette | 98 | 44 | 75.7 | 6.27 |
| Lake City | 99 | 64 | 80.8 | 6.95 | Logansport (1) | 96 | 49 | 73.4 | 5.47 |
| Madison | 95 | 73 | 80.0 | 7.23 | Logansport (2) | 96 | 49 | 73.4 | 5.47 |
| Manatee | 95 | 65 | 81.8 | 7.72 | Marengo | 98 | 63 | 78.1 | 10.50 |
| Matanzas | 95 | 70 | 79.3 | 4.17 | Marion | 97 | 57 | 73.3 | 3.60 |
| Merritt's Island | 96 | 70 | 83.4 | 5.45 | Mauzy | 98 | 45 | 75.9 | 4.90 |
| Pine Level | 66 | 77.6 | 6.54 | | Mount Vernon (1) | 96 | 60 | 80.1 | 2.26 |
| St. Francis Bks. | 95 | 66 | 80.6 | 6.55 | Mount Vernon (2) | 96 | 60 | 80.1 | 2.26 |
| San Antonio | 95 | 66 | 79.9 | 3.20 | Muncie | 104 | 61 | 80.8 | 3.16 |
| Tallahassee | 93 | 70 | 79.6 | 5.15 | Point Isabel | 95 | 35 | 72.8 | 5.32 |
| Villa City | 97 | 70 | 79.3 | 0.04 | Princeton | 101 | 60 | 79.0 | 3.75 |
| <i>Idaho.</i> | | | | | Richmond | 96 | 50 | 77.2 | 3.81 |
| Altamonte Springs | 97 | 58 | 81.4 | 6.20 | Rockville | 97 | 50 | 75.5 | 4.13 |
| Alva | 96 | 67 | 78.7 | 7.23 | Rushville | 96 | 50 | 75.5 | 4.13 |
| Fort Barrancas | 95 | 68 | 81.5 | 4.96 | Seymour | 95 | 52 | 77.3 | 4.41 |
| Fort Meade | 91 | 72 | 76.0 | 3.94 | Shelbyville | 96 | 64 | 78.5 | 3.91 |
| Homeland | 96 | 72 | 81.6 | 4.95 | Sumner | 97 | 48 | 75.3 | 5.87 |
| Hypoluxo | 74 | 81.2 | 3.66 | | Terre Haute | 102 | 53 | 78.1 | 2.74 |
| Lake City | 99 | 64 | 80.8 | 6.95 | Valparaiso | 96 | 46 | 71.4 | 2.71 |
| Madison | 95 | 73 | 80.0 | 7.23 | Vevay | 96 | 55 | 77.4 | 9.50 |
| Manatee | 95 | 65 | 81.8 | 7.72 | | | | | |
| Matanzas | 95 | 70 | 79.3 | 4.17 | | | | | |
| Merritt's Island | 96 | 70 | 83.4 | 5.45 | | | | | |
| Pine Level | 66 | 77.6 | 6.54 | | | | | | |
| St. Francis Bks. | 95 | 66 | 80.6 | 6.55 | | | | | |
| San Antonio | 95 | 66 | 79.9 | 3.20 | | | | | |
| Tallahassee | 93 | 70 | 79.6 | 5.15 | | | | | |
| Villa City | 97 | 70 | 79.3 | 0.04 | | | | | |

Meteorological record of voluntary observers, &c.—Continued.

| Stations. | Temperature. (Fahrenheit.) | | | Precip'n. | Stations. | Temperature. (Fahrenheit.) | | | Precip'n. |
|--------------------------|-------------------------------|------|-------|-------------|-----------------------|-------------------------------|------|-------|-------------|
| | Max. | Min. | Mean. | | | Max. | Min. | Mean. | |
| <i>Indiana—Cont'd.</i> | | | | <i>Ins.</i> | <i>Kansas—Cont'd.</i> | | | | <i>Ins.</i> |
| Vincennes | 96 | 59 | 75.2 | 2.55 | Luray | 105 | 56 | 79.4 | 4.00 |
| Worthington | 96 | 59 | 75.2 | 3.84 | Macksville | 97 | 43 | 73.3 | 5.63 |
| <i>Indian Territory.</i> | | | | | Manhattan (1) | 103 | 44 | 77.2 | 2.43 |
| Caddo Creek | 98 | 61 | 80.3 | | Manhattan (2) | 106 | 54 | 77.5 | 1.85 |
| Enid | 98 | 61 | 80.3 | | Manhattan (3) | 106 | 54 | 77.5 | 2.09 |
| Fort Gibson | 98 | 57 | 78.2 | 1.60 | Mankato | 96 | 53 | 75.8 | |
| Fort Reno | 101 | 49 | 76.9 | 0.76 | Marmaton | 98 | 54 | 78.4 | 2.42 |
| Fort Sill | 102 | 53 | 78.2 | 0.22 | McAllister | 105 | 50 | | 2.50 |
| Fort Supply | 98 | 45 | 76.6 | 2.37 | Minneapolis | 96 | 58 | 78.4 | 2.90 |
| Guthrie | 102 | 64 | 83.8 | 1.09 | Monument | 110 | 52 | 81.8 | 2.75 |
| Healdton | 98 | 55 | 76.5 | 2.11 | Morse | 97 | 49 | 75.8 | 2.69 |
| Tulsa | 98 | 55 | 76.5 | 0.85 | Norton | 101 | 42 | 74.5 | 4.01 |
| Woodward | 98 | 55 | 76.5 | 2.50 | Oakley | 110 | 54 | 82.1 | 1.00 |
| <i>Iowa.</i> | | | | | Oberlin | 100 | 56 | 76.3 | 3.06 |
| Alta | 93 | 52 | 71.5 | 7.40 | Offerle | 100 | 56 | 76.3 | 3.07 |
| Amana | 97 | 48 | 73.0 | 6.36 | Ogallah | 101 | 63 | 80.1 | 2.00 |
| Ames | 94 | 55 | 73.3 | 5.65 | Oswego | 101 | 54 | 78.3 | 1.26 |
| Atlantic | 100 | 39 | 73.1 | 5.30 | Quenemo | 100 | 48 | 76.8 | 2.15 |
| Bancroft | 97 | 49 | 70.6 | 5.93 | Quinter | 110 | 50 | | 0.75 |
| Belle Plaine | 97 | 56 | 71.9 | 6.63 | Rome | 104 | 53 | 77.8 | 1.29 |
| Blakeville | 100 | 51 | 74.0 | 8.45 | Salina | 93 | 60 | 79.3 | 2.85 |
| Carroll | 95 | 48 | 76.2 | 9.64 | Sedan | 104 | 58 | 79.3 | 4.73 |
| Cedar Rapids | 98 | 55 | 73.8 | 6.52 | Sharon Springs | 100 | 50 | 74.7 | 2.41 |
| Clinton | 98 | 49 | 73.5 | 9.54 | Shields | 102 | 48 | 77.0 | 1.37 |
| Cresco | 91 | 45 | 68.6 | 11.71 | Tribune | 104 | 42 | 74.3 | 0.59 |
| Des Moines | 98 | 49 | 73.6 | 6.40 | Wakefield | 107 | | | 1.82 |
| Eagle Grove | 98 | 53 | 74.7 | 11.95 | Wallace | 104 | 60 | 77.0 | 1.10 |
| Fayette | 94 | 47 | 69.6 | 16.53 | Wellington | 107 | 51 | 81.4 | 0.48 |
| Fort Madison | 98 | 60 | 77.5 | 6.36 | Weskan | 110 | 50 | 75.8 | 1 |

Meteorological record of voluntary observers, &c.—Continued.

| Stations. | Temperature. (Fahrenheit.) | | | Precip'n. | Stations. | Temperature. (Fahrenheit.) | | | Precip'n. |
|-------------------------|-------------------------------|------|------|-----------|-------------------------|-------------------------------|------|------|-----------|
| | Max. | Min. | Mean | | | Max. | Min. | Mean | |
| Maine—Cont'd. | | | | | Michigan—Cont'd. | | | | |
| Cornish..... | 84 | 45 | 63.8 | 6.58 | Atlantic..... | 76 | 40 | 58.1 | 3.20 |
| Fairfield..... | 88 | 40 | 61.1 | 2.97 | Ball Mountain..... | 89 | 39 | 68.8 | 3.52 |
| Farmington..... | 87 | 47 | 59.1 | 3.12 | Bangor..... | 100 | 40 | 75.3 | 5.27 |
| Fort Preble..... | 87 | 41 | 59.2 | 4.95 | Bear Lake..... | 91 | 34 | 67.8 | 2.18 |
| Kennebec Arsenal..... | 78 | 45 | 59.8 | 1.64 | Bell Branch..... | 92 | 40 | 71.0 | 3.29 |
| Kent's Hill..... | 83 | 42 | 59.2 | 4.64 | Benton Harbor..... | 97 | 43 | 74.5 | 5.24 |
| Lewiston..... | 88 | 42 | 60.8 | 3.71 | Berlin..... | 94 | 40 | 71.7 | 5.56 |
| Mayfield..... | 81 | 36 | 58.2 | 3.97 | Berrien Springs..... | 97 | 46 | 72.6 | 3.85 |
| Orono..... | 82 | 44 | 59.5 | 3.84 | Birmingham..... | 92 | 40 | 71.6 | 2.16 |
| Petit Menan..... | 72 | 44 | 57.4 | ..... | Bronson..... | 90 | 40 | 72.3 | 2.22 |
| West Jonesport..... | 70 | 46 | 54.4 | ..... | Buchanan..... | 90 | 45 | 70.6 | 5.24 |
| Maryland. | | | | | Calumet..... | 90 | 39 | 61.9 | 4.78 |
| Barren Creek Sp'g..... | 90 | 52 | 73.6 | 1.59 | Cassopolis..... | 93 | 40 | 72.5 | 4.43 |
| Cumberland (1)..... | 92 | 48 | 72.6 | 3.07 | Caldwell..... | 94 | 35 | 69.5 | 1.99 |
| Cumberland (2)..... | 93 | 49 | 74.2 | 3.16 | Charlevoix..... | 89 | 39 | 65.4 | 2.69 |
| Fallston..... | 90 | 50 | 71.7 | 2.37 | Chase..... | 96 | 35 | 69.0 | 4.55 |
| Fort McHenry..... | 92 | 50 | 73.3 | 1.40 | Cheboygan..... | 88 | 34 | 63.5 | 2.13 |
| Frederick..... | 92 | 51 | 74.0 | 1.58 | Chelsea..... | 85 | 35 | 70.0 | 4.32 |
| Guthrieburg..... | 92 | 56 | 70.9 | ..... | Clinton..... | 98 | 35 | 72.3 | 1.84 |
| Galena..... | 92 | 62 | 75.2 | 1.60 | Colon..... | 92 | 42 | 69.3 | 4.31 |
| Jewell..... | 92 | 62 | 70.4 | 1.84 | Concord..... | 95 | 41 | 70.5 | 2.64 |
| McDonogh..... | 90 | 52 | 73.0 | 2.38 | Crystal Falls..... | 88 | 40 | 65.2 | 3.24 |
| Mt. St. Mary's Col..... | 92 | 45 | 73.0 | 2.54 | Detroit..... | 93 | 41 | 73.8 | 4.00 |
| Woodstock..... | 92 | 46 | 72.2 | 1.22 | East Tawas..... | 95 | 40 | 67.0 | 2.41 |
| Massachusetts. | | | | | Eden..... | 92 | 42 | 71.7 | 5.96 |
| Amherst Ex Sta (1)..... | 86 | 38 | 64.6 | 1.48 | Ewart..... | 90 | 31 | 66.2 | 4.90 |
| Amherst Ex Sta (2)..... | 88 | 40 | 66.5 | 1.53 | Fairview..... | 92 | 41 | 71.0 | 3.74 |
| Andover..... | 85 | 47 | 63.1 | 4.38 | Fitchburg..... | 95 | 36 | 70.8 | 4.58 |
| Blue Hill (sum't)..... | 83 | 48 | 61.4 | 1.85 | Flint..... | 92 | 37 | 70.2 | 2.36 |
| Blue Hill (base)..... | 84 | 45 | 62.8 | 1.97 | Fort Brady..... | 87 | 34 | 61.3 | 4.60 |
| Blue Hill (valley)..... | 86 | 40 | 63.2 | 1.90 | Fort Mackinac..... | 79 | 40 | 60.4 | 3.99 |
| Boston..... | 85 | 44 | 64.3 | 2.53 | Fort Wayne..... | 95 | 39 | 72.2 | 3.99 |
| Brewster..... | 85 | 44 | 64.3 | 3.51 | Fremont..... | 95 | 42 | 70.2 | 2.86 |
| Cambridge (1)..... | 84 | 45 | 63.2 | 3.80 | Gaylord..... | 90 | 35 | 63.6 | 1.75 |
| Cambridge (2)..... | 85 | 47 | 64.4 | 3.51 | Gladwin..... | 95 | 35 | 67.4 | 2.28 |
| Chestnut Hill..... | 88 | 42 | 64.6 | 2.60 | Grand Rapids..... | 97 | 39 | 71.8 | 3.42 |
| Clinton..... | 85 | 43 | 63.6 | 2.70 | Grape..... | 99 | 36 | 70.9 | 3.02 |
| Cotuit..... | 83 | 45 | 62.6 | 3.68 | Grayling..... | 95 | 32 | 69.1 | 2.61 |
| Deerfield..... | 89 | 49 | 67.0 | ..... | Gulliver Lake..... | 90 | 42 | 64.3 | 5.36 |
| Dudley..... | 89 | 41 | 66.1 | 1.70 | Hanover..... | 94 | 40 | 70.7 | 3.81 |
| Fall River (1)..... | 83 | 50 | 62.8 | 3.76 | Harbor Springs..... | 96 | 38 | 68.8 | 2.26 |
| Fiskdale..... | 85 | 46 | 63.6 | 1.96 | Harrison..... | 95 | 35 | 69.5 | 3.11 |
| Fitchburg (1)..... | 85 | 46 | 63.6 | 1.96 | Harrisville..... | 90 | 32 | 61.6 | 2.68 |
| Fitchburg (2)..... | 86 | 43 | 63.4 | 1.97 | Hart..... | 95 | 36 | 69.5 | 3.05 |
| Fort Warren..... | 82 | 51 | 63.2 | 2.95 | Hastings..... | 94 | 42 | 71.9 | 5.94 |
| Framingham..... | 88 | 43 | 65.4 | 1.97 | Hayes..... | 91 | 40 | 68.4 | 3.80 |
| Gilbertville..... | 87 | 39 | 64.2 | 2.17 | Highland Station..... | 92 | 38 | 69.6 | 2.34 |
| Groton (1)..... | 86 | 45 | 64.8 | 3.08 | Hillsdale..... | 93 | 44 | 72.3 | 2.59 |
| Heath..... | 90 | 40 | 65.4 | 2.24 | Howell..... | 95 | 34 | 70.6 | 3.20 |
| Kendall Green..... | 84 | 50 | 66.8 | 2.24 | Hudson..... | 93 | 33 | 69.6 | 3.57 |
| Lake Cochituate..... | 89 | 41 | 65.4 | 1.78 | Ionia..... | 95 | 40 | 67.6 | 2.52 |
| Lawrence..... | 87 | 41 | 64.8 | 3.71 | Ivan..... | 98 | 33 | 69.5 | 2.09 |
| Leicester..... | 86 | 45 | 63.1 | 2.75 | Jeddo..... | 90 | 40 | 71.9 | 3.59 |
| Leominster..... | 86 | 45 | 63.1 | 2.60 | Kalamazoo..... | 92 | 50 | 69.0 | 3.77 |
| Long Plain..... | 84 | 52 | 64.6 | 5.01 | Lansing..... | 92 | 39 | 70.6 | 4.03 |
| Lowell (1)..... | 86 | 45 | 64.3 | 3.52 | Lathrop..... | 90 | 40 | 68.0 | 4.23 |
| Lowell (2)..... | 88 | 44 | 63.2 | 3.52 | Madison..... | 97 | 39 | 72.9 | 2.11 |
| Lowell (3)..... | 90 | 46 | 65.3 | 3.52 | Marshall..... | 97 | 47 | 71.9 | 3.85 |
| Ludlow (1)..... | 87 | 38 | 65.4 | 1.84 | May..... | 90 | 40 | 69.7 | 3.71 |
| Ludlow (2)..... | 86 | 37 | 62.6 | 2.87 | Montague..... | 89 | 38 | 66.9 | 2.80 |
| Lynn..... | 83 | 49 | 62.0 | 2.80 | Mottville..... | 95 | 37 | 72.1 | 5.21 |
| Manchester..... | 88 | 41 | 62.8 | 3.26 | Noble..... | 95 | 37 | 72.1 | 5.21 |
| Medford..... | 88 | 41 | 62.8 | 3.26 | North Marshall..... | 91 | 32 | 69.1 | 4.16 |
| Middleborough..... | 85 | 37 | 61.8 | 3.52 | Olivet..... | 91 | 39 | 68.8 | 2.77 |
| Milton..... | 85 | 49 | 62.0 | 1.94 | Otsego..... | 96 | 39 | 71.6 | 6.30 |
| Monson..... | 87 | 36 | 64.2 | 2.23 | Ovid..... | 94 | 38 | 71.0 | 3.78 |
| Mount Nonotuck..... | 87 | 36 | 64.2 | 2.23 | Parkville..... | 96 | 35 | 74.4 | 4.29 |
| Mystic Lake..... | 84 | 48 | 62.8 | 3.32 | Paw Paw..... | 87 | 45 | 69.2 | 5.04 |
| Mystic Station..... | 84 | 48 | 62.8 | 3.32 | Pontiac..... | 92 | 42 | 70.8 | 3.45 |
| Nahant..... | 84 | 48 | 62.8 | 3.32 | Pulaski..... | 92 | 44 | 73.4 | 1.85 |
| New Bedford (1)..... | 84 | 48 | 62.8 | 3.32 | Rawsonville..... | 96 | 44 | 73.4 | 1.85 |
| New Bedford (2)..... | 84 | 48 | 62.8 | 3.32 | Romeo..... | 93 | 39 | 69.4 | 2.98 |
| Newburyport (1)..... | 86 | 46 | 63.2 | 3.43 | Roscommon..... | 93 | 31 | 67.8 | 2.63 |
| Newburyport (2)..... | 86 | 46 | 63.2 | 3.43 | Saint Ignace..... | 84 | 38 | 60.6 | 2.30 |
| Northampton..... | 91 | 47 | 68.7 | 2.11 | Saint John's..... | 97 | 40 | 72.0 | 4.67 |
| North Billerica..... | 95 | 45 | 65.9 | 3.14 | Sand Beach..... | 89 | 37 | 64.5 | 3.34 |
| Plymouth..... | 85 | 52 | 64.3 | 3.41 | Stanton..... | 95 | 35 | 69.6 | 6.05 |
| Princeton..... | 85 | 44 | 62.8 | 2.62 | Stockbridge..... | 95 | 35 | 69.6 | 6.05 |
| Provincetown..... | 83 | 44 | 62.8 | 3.46 | Thornville..... | 91 | 42 | 71.7 | 3.39 |
| Randolph..... | 85 | 44 | 62.8 | 3.46 | Vienna..... | 92 | 40 | 71.7 | 3.24 |
| Roberts' Dam..... | 85 | 44 | 62.8 | 3.46 | Washington..... | 89 | 39 | 68.7 | 2.57 |
| Royalston..... | 85 | 39 | 65.8 | ..... | Weldon Creek..... | 94 | 36 | 68.1 | 2.89 |
| Salem (1)..... | 87 | 39 | 62.8 | ..... | White Pigeon..... | 92 | 34 | 68.5 | 2.45 |
| Salem (2)..... | 87 | 39 | 62.8 | ..... | Williamston..... | 90 | 40 | 71.0 | 4.95 |
| Somerset..... | 92 | 48 | 67.8 | 4.31 | Ypsilanti (1)..... | 90 | 37 | 68.5 | 2.09 |
| South Hingham..... | 92 | 48 | 67.8 | 4.31 | Ypsilanti (2)..... | 91 | 42 | 69.5 | 2.17 |
| Springfield Arm'y..... | 88 | 37 | 67.5 | 1.83 | Minnesota. | | | | |
| Swampscott..... | 84 | 50 | 63.8 | 1.18 | Alexandria..... | 96 | 42 | 67.8 | 7.97 |
| Taunton (1)..... | 90 | 44 | 64.0 | 3.77 | Crookston..... | 96 | 42 | 67.8 | 8.30 |
| Taunton (2)..... | 88 | 44 | 64.7 | 3.89 | Farmington..... | 92 | 54 | 69.3 | ..... |
| Taunton (3)..... | 87 | 37 | 63.0 | 3.13 | Fergus Falls..... | 92 | 42 | 69.3 | ..... |
| Wakefield..... | 86 | 42 | 63.0 | ..... | Fort Ripley..... | 92 | 42 | 69.3 | ..... |
| Waltham..... | 85 | 42 | 64.0 | 2.06 | Fort Snelling..... | 94 | 49 | 69.2 | 7.76 |
| Wellesley..... | 85 | 42 | 64.0 | 2.06 | Grand Meadow..... | 100 | 50 | 70.4 | 7.23 |
| Westborough..... | 94 | 44 | 67.7 | 1.76 | L. Winnibogishish..... | 94 | 49 | 67.1 | 5.19 |
| Williamstown..... | 81 | 40 | 64.6 | 1.72 | Leach Lake..... | 94 | 37 | 67.7 | 5.01 |
| Winchester..... | 81 | 40 | 64.6 | 1.72 | Le Sueur..... | 95 | 34 | 70.5 | 8.59 |
| Mexico. | | | | | Mankato..... | 90 | 50 | 69.9 | 3.97 |
| Leon de Aldemas..... | 92 | 56 | 69.8 | 8.89 | Medford..... | 91 | 42 | 67.8 | 9.64 |
| Michigan. | | | | | Minneapolis..... | 94 | 54 | 69.2 | 5.97 |
| Adrian..... | 98 | 37 | 71.5 | 2.61 | Montevideo..... | 91 | 44 | 66.5 | 8.11 |
| Allegan..... | 94 | 38 | 70.6 | 3.78 | Morris..... | 92 | 48 | 69.4 | 4.38 |
| Alma..... | 94 | 38 | 70.6 | 3.78 | Northfield..... | 92 | 52 | 68.8 | 10.29 |
| Ann Arbor..... | 92 | 42 | 71.9 | 3.34 | | | | | |
| Arbela..... | 92 | 42 | 71.9 | 3.34 | | | | | |

Meteorological record of voluntary observers, &c.—Continued.

| Stations. | Temperature. (Fahrenheit.) | | | Precip'n. | Stations. | Temperature. (Fahrenheit.) | | | Precip'n. |
|---------------------------|-------------------------------|------|-------|-------------|------------------------|-------------------------------|------|------|-----------|
| | Max. | Min. | Mean | | | Max. | Min. | Mean | |
| Minnesota—Cont'd. | | | | | Montana—Cont'd. | | | | |
| Ortonville† | ° | ° | ° | <i>Ins.</i> | Fort Maginnis A..... | 85 | 36 | 55.8 | 3.11 |
| Pine River..... | 94 | 50 | 67.4 | 2.56 | Fort Missoula..... | 90 | 33 | 56.8 | 3.10 |
| Pokeyama Falls..... | 94 | 43 | 65.8 | 7.42 | Fort Shaw..... | 90 | 41 | 60.4 | 1.41 |
| Red Wing..... | 92 | 52 | 69.7 | 8.03 | Galpin†..... | 104 | 37 | 69.8 | 5.03 |
| Redwood Falls†..... | 92 | 52 | 69.7 | 8.03 | Glendive†..... | 104 | 37 | 69.8 | 3.06 |
| Rolling Green..... | 90 | 52 | 69.1 | 7.78 | Kintyre..... | 92 | 32 | 58.8 | 3.00 |
| Saint Charles *..... | 93 | 54 | 67.0 | 12.00 | Martindale..... | 92 | 32 | 58.8 | 1.89 |
| Sheldon *..... | 93 | 60 | 71.4 | 10.82 | Powder River†..... | 91 | 41 | 64.8 | 3.84 |
| Tracy†..... | 98 | 50 | 77.6 | 6.19 | Woodworth *..... | 88 | 33 | 57.8 | 1.54 |
| Mississippi. | | | | | Nebraska. | | | | |
| Aberdeen..... | 98 | 60 | 77.6 | 4.05 | Alliance..... | 105 | 32 | 67.3 | 1.86 |
| Agricultural College..... | 95 | 65 | 81.6 | 3.20 | Ansley†..... | 108 | 38 | 71.1 | 2.60 |
| Batesville†..... | 98 | 64 | 80.9 | 2.83 | Ashland..... | 100 | 46 | 75.2 | 4.92 |
| Booneville *..... | 98 | 60 | 81.0 | 4.75 | Bassett..... | 98 | 53 | 71.2 | 3.00 |
| Brookhaven..... | 98 | 62 | 79.4 | 6.51 | Bingham..... | 98 | 56 | 64.9 | 3.52 |
| Canton..... | 95 | 66 | 78.4 | 3.07 | Culbertson (1)..... | 105 | 33 | 80.8 | 3.14 |
| Columbus (2)..... | 104 | 61 | 84.0 | 3.80 | Culbertson (2)†..... | 105 | 33 | 80.8 | 3.14 |
| Corinth..... | 98 | 50 | 79.0 | 2.30 | David City..... | 92 | 46 | 64.8 | 5.25 |
| Edwardsville..... | 98 | 65 | 81.9 | 3.32 | De Soto *..... | 96 | 52 | 72.8 | 8.05 |
| Fayette..... | 95 | 65 | 79.9 | 4.13 | Elwood *..... | 98 | 58 | 78.8 | 4.54 |
| Greenville..... | 95 | 66 | 82.0 | 2.31 | Fairbury..... | 96 | 79 | 79.7 | 3.16 |
| Hattiesburg..... | 99 | 61 | 78.6 | 4.95 | Fairfield..... | 98 | 45 | 77.5 | 3.81 |
| Hazlehurst..... | 95 | 64 | 79.6 | 4.62 | Fort Niobrara..... | 100 | 35 | 66.0 | 3.00 |
| Hernando..... | 92 | 58 | 76.0 | 3.35 | Fort Omaha..... | 98 | 50 | 74.9 | 6.15 |
| Holly Springs (1) *..... | 94 | 65 | 80.6 | 3.05 | Fort Robinson..... | 99 | 36 | 67.2 | 0.60 |
| Holly Springs (2)..... | 98 | 60 | 80.4 | 2.04 | Fort Sidney..... | 99 | 35 | 67.8 | 0.68 |
| Jackson..... | 98 | 60 | 80.8 | 2.37 | Fremont *..... | 95 | 50 | 73.0 | 6.99 |
| Kosciusko†..... | 94 | 63 | 78.8 | 1.03 | Genoa†..... | 98 | 50 | 72.8 | 4.38 |
| Lake†..... | 96 | 61 | 78.8 | 3.66 | Gering..... | 99 | 36 | 68.4 | 0.62 |
| Logtown..... | 94 | 69 | 79.6 | 4.88 | Grant..... | 105 | 32 | 67.3 | 1.86 |
| Louisville†..... | 102 | 60 | 80.4 | 3.73 | Hay Springs..... | 102 | 36 | 65.0 | 4.55 |
| Macon (2)..... | 100 | 48 | 78.6 | 1.45 | Hebron..... | 99 | 51 | 75.5 | 3.45 |
| Moss Point..... | 98 | 68 | 82.3 | 6.72 | Holdegre..... | 100 | 53 | 73.8 | 1.71 |
| Natchez (1)..... | 91 | 67 | 79.0 | 5.56 | Howe..... | 98 | 53 | 76.4 | 3.75 |
| Natchez (2)..... | 97 | 66 | 80.5 | 5.78 | Imperial..... | 103 | 58 | 79.5 | 3.34 |
| Okolona†..... | 103 | 62 | 82.2 | 2.44 | Kennedy..... | 101 | 44 | 68.0 | 6.66 |
| Pearlington†..... | 90 | 74 | 81.5 | 5.07 | Kimball..... | 101 | 35 | 67.2 | 0.75 |
| Port Gibson†..... | 95 | 61 | 79.4 | 3.02 | Lexington *..... | 97 | 54 | 70.8 | 2.46 |
| Pontotoc..... | 94 | 64 | 76.5 | 3.47 | Long Pine..... | 103 | 50 | 73.1 | ... |
| Rienai..... | 101 | 67 | 80.7 | 5.37 | Marquette (1)..... | 101 | 48 | ... | 2.60 |
| Vaiden..... | 103 | 63 | 81.8 | 4.40 | Minden..... | 102 | 50 | 73.3 | 4.55 |
| Washington..... | 94 | 66 | 79.8 | 3.29 | Nebraska City..... | 99 | 49 | 73.9 | 5.21 |
| Water Valley *..... | 104 | 60 | 81.6 | 3.50 | North Loup *†..... | 95 | 42 | 70.8 | 3.63 |
| Waynesboro' (1)†..... | 94 | 64 | 80.2 | 4.31 | Oakdale..... | 97 | 45 | 71.1 | 3.23 |
| Waynesboro' (2)..... | 99 | 54 | 79.4 | 3.69 | O'Neill..... | 105 | 32 | 67.3 | 1.82 |
| West Point..... | 92 | 69 | 81.4 | 2.41 | Ough..... | 105 | 32 | 67.3 | 1.82 |
| Yasoo City†..... | 98 | 50 | 77.6 | 4.17 | Palmer..... | 96 | 52 | 71.8 | 2.42 |
| Missouri. | | | | | Plattsmouth†..... | 100 | 40 | 73.0 | 2.75 |
| Adrian..... | 98 | 53 | 76.6 | 4.17 | Ravenna..... | 100 | 40 | 73.0 | 2.75 |
| Austin..... | 97 | 50 | 78.4 | 1.95 | Syracuse *..... | 101 | 59 | 76.5 | 4.00 |
| Appleton City..... | 100f | 58 | 78.4f | 3.34 | Tecumseh..... | 97 | 56 | 76.1 | 1.33 |
| Bethany..... | 94 | 60 | 80.1 | 3.75 | Tekamah..... | 94 | 55 | 76.1 | 1.33 |
| Boonville..... | 98 | 62 | 79.4 | 2.48 | Theford..... | 108 | 56 | 78.4 | 2.00 |
| Bradleyville..... | 96 | 62 | 79.4 | 0.75 | Weeping Water *..... | 101 | 48 | 72.2 | 5.61 |
| Brunswick..... | 97 | 53 | 76.9 | 2.65 | West Hill..... | 96 | 55 | 70.1 | 4.36 |
| Carrollton..... | 95k | 60 | 75.2 | ... | Weston..... | 100 | 56 | 76.0 | 6.91 |
| Carthage†..... | 96 | 54 | 75.2 | 3.96 | West Point..... | 91 | 62 | ... | 8.95 |
| Cassville..... | 95 | 50 | 73.8 | 2.12 | Wilcox..... | 105 | 43 | ... | 5.09 |
| Centerville..... | 95 | 45 | 73.8 | 1.80 | Nevada. | | | | |
| Conception..... | 95 | 52 | 76.4 | 2.70 | Austin..... | 85 | 31 | 58.6 | 0.05 |
| Craig..... | 99 | 60 | 75.6 | 1.80 | Belmont..... | 90 | 50 | 69.6 | 0.00 |
| Dunnegan..... | 99 | 51 | 74.9 | ... | Belmont..... | 83 | 33 | 59.3 | T. |
| Eldon..... | 106 | 58 | 81.2 | 1.37 | Beowawe *..... | 93 | 43 | 67.7 | 0.00 |
| Excelsior Springs *..... | 100 | 45 | 74.8 | 4.25 | Browns..... | 95 | 48 | 74.5 | 0.00 |
| Fayette†..... | 100 | 51 | 77.1 | 1.38 | Candelaria..... | 87 | 35 | 62.9 | ... |
| Glasgow..... | 97 | 52 | 76.4 | 1.59 | Carlin..... | 90 | 36 | 59.8 | 0.00 |
| Glenwood..... | 97g | 44g | 76.79 | 3.77 | Carson City..... | 91 | 27 | 62.3 | T. |
| Grand Pass..... | 96 | 55 | 76.3 | 1.78 | Columbus Marsh..... | 101 | 36 | 65.6 | 0.00 |
| Hannibal..... | 98 | 54 | ... | 3.50 | Crane's Ranch..... | 101 | 36 | 65.6 | 0.00 |
| Harrisonville†..... | 96 | 58 | 75.0 | 2.35 | Downeyville..... | 92 | 37 | 65.0 | T. |
| Hermann†..... | 97 | 62 | 77.6 | 3.27 | Eldorado..... | 109 | 62 | 84.5 | 0.00 |
| Ironton *..... | 95 | 62 | 77.6 | 1.40 | Elko (1)..... | 94 | 38 | 59.0 | 0.00 |
| Jefferson Barracks..... | 100 | 52 | 77.9 | 1.22 | Ely..... | 89 | 24 | 59.2 | 0.00 |
| Jerome..... | 99 | 51 | 77.9 | 1.08 | Eureka..... | 91 | 29 | 60.1 | T. |
| Kansas City..... | 100 | 50 | 77.9 | 2.00 | Fenelon..... | 98 | 43 | 65.9 | 0.00 |
| Lamar..... | 100 | 50 | 75.9 | 1.50 | Genoa..... | 86 | 31 | 59.5 | 0.00 |
| Lamonte..... | 104 | 60 | 80.9 | 0.37 | Golconda..... | 98 | 40 | 69.0 | 0.00 |
| Lebanon..... | 94 | 60 | 79.0 | ... | Gold Mountain..... | 87 | 36 | 65.8 | 0.00 |
| Liberty..... | 103 | 49 | 78.7 | ... | Halleck..... | 92 | 36 | 63.9 | 0.13 |
| Louisiana Bridge†..... | 97 | 58 | 76.0 | 2.78 | Hawthorne (1)..... | 98 | 52 | 71.1 | 0.00 |
| New Frankfurt..... | 97 | 58 | 76.0 | 1.85 | Hot Springs (1)..... | 90 | 45 | 63.1 | 0.00 |
| New Haven *..... | 101 | 62 | 80.1 | 3.15 | Hot Springs (2)..... | 90 | 45 | 59.9 | 0.00 |
| Oak Ridge *..... | 103 | 60 | 76.5 | 0.70 | Humboldt *..... | 86 | 40 | 62.8 | 0.00 |
| Oregon..... | 96 | 50 | 76.8 | 2.53 | Lewers Ranch..... | 90 | 30 | 57.6 | 0.00 |
| Platt River..... | 96 | 46 | 76.8 | ... | Palisade *..... | 88 | 38 | 62.9 | 0.00 |
| Princeton *..... | 103 | 51 | 75.3 | 7.47 | Pioche..... | 81 | 26 | 55.8 | 0.25 |
| Saint Charles (1)..... | 95 | 50 | 75.0 | 3.97 | Punch Bowl..... | 81 | 26 | 55.8 | 0.00 |
| Saint Joseph†..... | 99 | 53 | 80.5 | 1.11 | Reno *..... | 99 | 44 | 63.9 | 0.00 |
| Sarcocix..... | 95 | 50 | 75.0 | 4.90 | Ruby Hill..... | 78 | 24 | 51.8 | 0.30 |
| Stedalia..... | 99 | 53 | 80.5 | 1.11 | Tecoma..... | 98 | 38 | 65.1 | 0.25 |
| Sthelbina..... | 96 | 50 | 76.7 | 3.30 | Toano..... | 87 | 44 | 64.1 | 0.25 |
| Stellada..... | 96 | 50 | 76.7 | ... | Tuscarora..... | 88 | 37 | 53.3 | 0.15 |
| Warrensburg..... | 98 | 56 | 76.3 | 1.00 | Wadsworth..... | 96 | 42 | 67.7 | 0.00 |
| Warrenton..... | 99 | 59 | 79.6 | 2.26 | Winnemucca..... | 88 | 39 | 65.4 | 0.00 |
| Willow Springs†..... | 105 | 50 | 76.9 | 1.69 | Wells..... | 92 | 32 | 67.1 | 0.05 |
| Wither's Mills..... | 98 | 50 | 76.9 | 3.95 | Newfoundland. | | | | |
| Montana. | | | | | Saint John's..... | 68 | 40 | 54.8 | 2.78 |
| Blackfeet Agency..... | 88 | 35 | 57.0 | 1.48 | New Hampshire. | | | | |
| Clamp Poplar River..... | 91 | 38 | 63.9 | 3.79 | Antrim..... | 86 | 36 | 58.4 | 2.00 |
| Choteau..... | 93 | 36 | 58.2 | 2.15 | Belmont..... | 86 | 36 | 58.4 | 1.65 |
| Custer..... | 97 | 39 | 61.1 | 3.50 | Berlin Falls..... | 86 | 36 | 58.4 | 2.00 |
| Fort Assiniboine..... | 97 | 39 | 61.1 | 3.01 | Berlin Mills *..... | 87 | 39 | 57.8 | 4.29 |
| Fort Custer..... | 91 | 40 | 63.0 | 2.36 | Concord..... | 87 | 43 | 62.4 | 2.56 |
| Fort Keogh..... | 95 | 39 | 65.0 | 5.40 | East Canterbury..... | 86 | 42 | 63.0 | 2.77 |
| Fort Logan†..... | 96 | 30 | 54.4 | 2.80 | Hanover (1)..... | 83 | 38 | 63.5 | 2.63 |

Meteorological record of voluntary observers, &c.—Continued.

| Stations. | Temperature. (Fahrenheit.) | | | Precip'n. | Stations. | Temperature. (Fahrenheit.) | | | Precip'n. |
|--------------------------|-------------------------------|------|------|-------------|-------------------------|-------------------------------|------|------|-------------|
| | Max. | Min. | Mean | | | Max. | Min. | Mean | |
| <i>N. Hampshire—Con.</i> | | | | <i>Ins.</i> | <i>New York—Cont'd.</i> | | | | <i>Ins.</i> |
| Hanover (2)..... | 88 | 37 | 63.1 | 2.70 | Kendall..... | 96 | 32 | 64.6 | 2.92 |
| Lake Village..... | 88 | 37 | 63.1 | 2.71 | Le Roy..... | 86 | 46 | 64.6 | 2.77 |
| Manchester (1)..... | 88 | 42 | 64.5 | 4.15 | Lyons..... | 86 | 46 | 67.7 | 3.77 |
| Mine Falls..... | 89 | 40 | 64.1 | 2.61 | Madison Barracks..... | 85 | 44 | 65.4 | 3.35 |
| Nashua..... | 89 | 40 | 64.1 | 3.39 | Marshland..... | 89 | 37 | 63.8 | 3.99 |
| Newton..... | 88 | 44 | 63.0 | 3.06 | Middleburgh..... | 86 | 41 | 66.1 | 3.20 |
| North Conway..... | 89 | 38 | 61.0 | 4.21 | Middletown..... | 86 | 47 | 68.5 | 4.63 |
| North Sutton..... | 47 | 60.2 | 2.95 | | New Lisbon..... | 82 | 48 | 62.9 | 3.31 |
| Pennichuck Station..... | 89 | 34 | 61.2 | 2.95 | North Hammond..... | 88 | 49 | 66.5 | 3.12 |
| Plymouth..... | 90 | 33 | 64.2 | 3.88 | Number Four..... | 81 | 37 | 61.7 | 4.01 |
| Stratford..... | 85 | 38 | 62.4 | 3.39 | Ogdensburg..... | 90 | 44 | 66.9 | |
| Walpole..... | 85 | 38 | 62.4 | 3.39 | Oxford..... | 85 | 41 | 64.0 | 5.27 |
| West Milan..... | 82 | 30 | 57.9 | 6.45 | Palermo..... | 86 | 41 | 66.4 | 2.60 |
| Wier's Bridge..... | 82 | 30 | 57.9 | 6.45 | Palmyra..... | 89 | 50 | 70.0 | 4.83 |
| Wolfborough..... | 82 | 30 | 57.9 | 6.45 | Peekskill..... | 89 | 39 | 66.3 | 6.30 |
| <i>New Jersey.</i> | | | | | Pendleton Centre..... | 89 | 39 | 66.3 | 6.30 |
| Allaire..... | 90 | 45 | 67.0 | | Perry City..... | 86 | 45 | 64.6 | 4.55 |
| Asbury Park..... | 91 | 51 | 70.8 | 3.17 | Plattsburgh..... | 82 | 44 | 64.3 | 3.40 |
| Bellefonte..... | 90 | 52 | 71.0 | 3.42 | Plattsburgh B'ks..... | 82 | 42 | 64.3 | 3.35 |
| Billingport L. H..... | 94 | 58 | 76.1 | | Port Jervis..... | 89 | 44 | 66.4 | 4.47 |
| Bridgeport..... | 93 | 60 | 75.8 | 0.99 | Potsdam..... | 84 | 38 | 63.9 | 4.27 |
| Cape May C. H..... | 91 | 50 | 71.4 | 1.58 | Poughkeepsie..... | 89 | 40 | 67.4 | 2.45 |
| Egg Harbor City..... | 94 | 50 | 70.2 | 2.88 | Quaker Street..... | 88 | 46 | 65.7 | 2.21 |
| Freehold..... | 90 | 50 | 69.0 | 3.58 | Rome..... | 88 | 40 | 66.1 | 6.59 |
| Gillette..... | 90 | 42 | 68.4 | 3.38 | Setauket..... | 87 | 50 | 66.1 | 2.97 |
| Highland Park..... | 88 | 51 | 69.4 | 3.91 | Sherman..... | 89 | 36 | 64.5 | 5.03 |
| Hopewell..... | 95 | 51 | 69.7 | 4.19 | South Canisteo..... | 89 | 36 | 64.5 | 5.03 |
| Imlaystown..... | 95 | 51 | 69.7 | 4.19 | South Kortright..... | 87 | 36 | 62.1 | 4.66 |
| Junction..... | 90 | 56 | 70.2 | 4.96 | Southeast Reserv..... | 84 | 43 | 65.1 | 3.63 |
| Lambertville..... | 92 | 50 | 70.8 | 4.10 | Turin..... | 88 | 41 | 66.1 | 6.19 |
| Locktown..... | 91 | 47 | 69.0 | 4.91 | Utica..... | 88 | 44 | 68.0 | 2.10 |
| Madison..... | 91 | 57 | 71.2 | 3.11 | Watervliet Arsenal..... | 90 | 46 | 65.8 | 3.52 |
| Moorestown..... | 91 | 57 | 71.2 | 3.11 | Wedgwood..... | 90 | 46 | 65.8 | 3.52 |
| Newark (1)..... | 90 | 57 | 71.1 | 4.44 | West Point..... | 93 | 45 | 67.4 | 4.60 |
| Newark (2)..... | 92 | 47 | 70.4 | 3.77 | White Plains..... | 97 | 60 | 68.6 | 6.11 |
| New Brunswick (1)..... | 87 | 50 | 68.6 | 3.83 | Willels Point..... | 86 | 53 | 69.0 | 5.30 |
| New Brunswick (2)..... | 87 | 49 | 68.0 | 3.03 | <i>North Carolina.</i> | | | | |
| New Brunswick (3)..... | 87 | 49 | 68.0 | 3.03 | Asheville (1)..... | 90 | 53 | 71.7 | 1.13 |
| Ocean City..... | 90 | 56 | 72.5 | | Asheville (2)..... | 90 | 53 | 71.7 | 1.13 |
| Oceanic..... | 90 | 56 | 72.5 | | Bryson City..... | 102 | 59 | 79.1 | 3.86 |
| Rancocas..... | 90 | 56 | 72.5 | | Chapel Hill..... | 102 | 59 | 79.1 | 3.86 |
| Readington..... | 90 | 56 | 72.5 | | Clear Creek..... | 97 | 50 | 78.4 | 2.84 |
| South Orange..... | 90 | 56 | 72.5 | | Currituck Inlet..... | 101 | 47 | 78.4 | 1.20 |
| Tenafly..... | 93 | 56 | 68.4 | 5.16 | Douglas..... | 101 | 47 | 78.4 | 1.20 |
| Trenton..... | 90 | 60 | 76.0 | 2.90 | Fayetteville..... | 101 | 47 | 78.4 | 1.20 |
| Union..... | 97 | 57 | 68.2 | 4.17 | Franklin..... | 93 | 40 | 71.0 | 2.08 |
| Woodbury..... | 95 | 56 | 74.0 | 1.43 | Goldsborough..... | 93 | 40 | 71.0 | 2.08 |
| <i>New Mexico.</i> | | | | | Highlands..... | 84 | 46 | 66.6 | 3.22 |
| Albuquerque..... | 97 | 45 | 71.7 | 0.00 | Hot Springs..... | 93 | 54 | 75.0 | |
| Chama..... | 92 | 33 | 59.8 | 0.55 | Lenoir..... | 90 | 60 | 73.8 | 2.80 |
| Coalinga..... | 93 | 35 | 64.0 | 0.80 | Lumberton..... | 99 | 58 | 80.6 | 6.80 |
| Deming..... | 102 | 60 | 78.0 | 0.16 | Marion..... | 97 | 52 | 75.1 | 2.64 |
| Fort Bayard..... | 90 | 43 | 64.5 | 0.16 | Mount Airy..... | 95 | 42 | 75.4 | 1.72 |
| Fort McCoy..... | 90 | 33 | 64.5 | 0.16 | Mount Holly..... | 98 | 60 | 77.5 | 3.19 |
| Fort Selden..... | 104 | 46 | 77.4 | 0.29 | Mount Pleasant..... | 94 | 60 | 74.0 | 3.85 |
| Fort Stanton..... | 94 | 37 | 69.4 | 1.09 | Morganton..... | 94 | 60 | 74.0 | 3.85 |
| Fort Union..... | 94 | 37 | 69.4 | 1.09 | Murphy..... | 96 | 58 | 78.5 | 5.09 |
| Fort Wingate..... | 91 | 36 | 58.6 | 0.10 | New Bern..... | 95 | 58 | 76.9 | 3.25 |
| Gallinas Spring..... | 91 | 36 | 58.6 | 0.10 | Pittsborough..... | 95 | 58 | 76.9 | 3.25 |
| Hillsborough..... | 97 | 45 | 71.2 | 0.13 | Raleigh..... | 95 | 60 | 80.0 | 2.01 |
| Lordsburg..... | 98 | 65 | 83.1 | 0.43 | Salisbury..... | 95 | 60 | 80.0 | 2.01 |
| Los Lunas..... | 98 | 49 | 74.6 | 0.88 | Smithfield..... | 95 | 60 | 80.0 | 2.01 |
| Nogal..... | 98 | 49 | 74.6 | 0.88 | Soapstone Mount..... | 95 | 60 | 80.0 | 2.01 |
| Red Canyon..... | 103 | 35 | 73.0 | 0.41 | Wadesborough..... | 96 | 60 | 78.6 | 2.62 |
| Roswell..... | 96 | 49 | 68.2 | 0.48 | Washington..... | 99 | 56 | 77.6 | 6.99 |
| Springer..... | 96 | 49 | 68.2 | 0.48 | Weldon..... | 99 | 56 | 77.6 | 6.99 |
| Tequesquite..... | 100 | 48 | 80.4 | 1.22 | Willeyton..... | 95 | 58 | 76.0 | 4.50 |
| <i>New York.</i> | | | | | <i>North Dakota.</i> | | | | |
| Adelphi Academy..... | 84 | 35 | 69.2 | | Davenport..... | 90 | 43 | 70.0 | 5.75 |
| Brooklyn..... | 92 | 40 | 67.7 | 5.99 | Fort A. Lincoln..... | 93 | 43 | 67.2 | 10.93 |
| Alfred Centre..... | 83 | 41 | 64.7 | 3.42 | Fort Buford..... | 91 | 41 | 65.7 | 5.23 |
| Angelica..... | 87 | 36 | 65.3 | 4.52 | Fort Pembina..... | 97 | 36 | 67.8 | 5.84 |
| Arcade..... | 85 | 34 | 65.3 | 5.23 | Fort Totten..... | 93 | 42 | 67.2 | 5.70 |
| Ardonia..... | 87 | 36 | 65.3 | 5.23 | Fort Yates..... | 97 | 47 | 69.3 | 6.74 |
| Baldwinsville..... | 87 | 36 | 65.3 | 5.23 | Gallatin..... | 90 | 48 | 65.3 | 3.51 |
| Binghamton..... | 87 | 36 | 65.3 | 5.23 | Grand Forks..... | 99 | 41 | 68.1 | 3.77 |
| Boyd's Corners..... | 93 | 56 | 69.2 | 4.77 | Napoleon..... | 95 | 39 | 66.0 | 7.19 |
| Brookport..... | 94 | 44 | 68.5 | 3.59 | New England City..... | 98 | 34 | 62.6 | 6.93 |
| Brookfield..... | 97 | 38 | 63.8 | 4.72 | Steele..... | 92 | 40 | 67.1 | 7.93 |
| Canton..... | 89 | 40 | 65.7 | 3.33 | Wahpeton..... | 93 | 42 | 72.5 | 5.75 |
| Carmel..... | 88 | 47 | 68.6 | 3.26 | Wild Rice..... | 91 | 51 | 67.5 | 7.07 |
| Conestableville..... | 88 | 31 | 63.5 | 3.90 | <i>Ohio.</i> | | | | |
| Cooperstown..... | 85 | 41 | 65.4 | 4.89 | Akron..... | 89 | 46 | 71.2 | 4.02 |
| David's Island..... | 90 | 52 | 67.7 | 5.63 | Ashland..... | 89 | 56 | 73.4 | 3.93 |
| East Hampton..... | 93 | 46 | 65.4 | 2.71 | Athens..... | 91 | 48 | 72.8 | 2.91 |
| Eden..... | 97 | 42 | 71.5 | 4.63 | Bangorville..... | 92 | 46 | 70.1 | 5.12 |
| Elmira..... | 97 | 42 | 71.5 | 4.63 | Bellefonte..... | 90 | 52 | 69.9 | 5.47 |
| Factoryville..... | 84 | 40 | 66.0 | 4.78 | Bement..... | 92 | 44 | 71.5 | 3.13 |
| Fleming..... | 87 | 44 | 65.2 | 6.72 | Bucyrus..... | 92 | 46 | 73.8 | 5.27 |
| Fort Columbus..... | 91 | 53 | 70.0 | 4.29 | Caledonia..... | 91 | 46 | 71.6 | 2.21 |
| Fort Hamilton..... | 98 | 53 | 68.7 | 2.98 | Canton..... | 91 | 46 | 71.6 | 2.21 |
| Fort Niagara..... | 86 | 44 | 68.9 | 4.59 | Carrollton..... | 94 | 54 | 71.2 | 5.10 |
| Fort Porter..... | 86 | 47 | 67.3 | 5.76 | Celina..... | 92 | 46 | 74.8 | 3.60 |
| Fort Schuyler..... | 88 | 54 | 67.7 | 4.32 | Circleville (1)..... | 92 | 46 | 74.8 | 3.60 |
| Fort Wadsworth..... | 93 | 48 | 71.1 | 4.18 | Circleville (2)..... | 93 | 51 | 73.6 | 4.83 |
| Geneva..... | 91 | 45 | 67.5 | 5.43 | Cleveland..... | 89 | 49 | 70.2 | 5.22 |
| Hess Road Station..... | 86 | 45 | 67.0 | 6.48 | College Hill..... | 96 | 61 | 78.3 | 3.80 |
| Honeyhead Brook..... | 85 | 43 | 65.7 | 3.46 | Columbus Barracks..... | 96 | 47 | 73.8 | 5.68 |
| Humphrey..... | 87 | 36 | 67.1 | 3.76 | Dayton..... | 97 | 50 | 77.6 | 3.28 |
| Iliac..... | 90 | 48 | 66.2 | 7.45 | Demos..... | 88 | 54 | 72.7 | 5.62 |
| Ithaca..... | 88 | 48 | 68.4 | 4.94 | Elyria..... | 96 | 47 | 72.8 | 4.03 |
| Keene Valley..... | 89 | 38 | 65.3 | 2.34 | Findlay..... | 94 | 45 | 72.5 | 3.80 |
| | | | | | Postoria..... | 97 | 48 | 75.5 | 5.34 |

Meteorological record of voluntary observers, &c.—Continued.

| Stations. | Temperature. (Fahrenheit.) | | | Precip'n. | Stations. | Temperature. (Fahrenheit.) | | | Precip'n. |
|------------------------|-------------------------------|------|------|-------------|--------------------------|-------------------------------|------|------|-------------|
| | Max. | Min. | Mean | | | Max. | Min. | Mean | |
| <i>Ohio—Cont'd.</i> | o | o | o | <i>Ins.</i> | <i>Pennsylvania—Con.</i> | o | o | o | <i>Ins.</i> |
| Garrettsville..... | 86 | 38 | 67.6 | 3.73 | Lewistown..... | 95 | 45 | 70.1 | 3.76 |
| Georgetown..... | 96 | 53 | 75.9 | 6.38 | Ligonier..... | 91 | 39 | 72.1 | 1.94 |
| Gratiot..... | 90 | 50 | 72.8 | 7.97 | Lock Haven..... | 92 | 42 | 70.7 | 3.61 |
| Greenville..... | 90 | 46 | 73.5 | 4.66 | Lock No. 4..... | 97 | 45 | 70.8 | 2.89 |
| Hanging Rock..... | 95 | 52 | 72.8 | 5.42 | Lynnport..... | 97 | 45 | 70.8 | 4.40 |
| Hassan..... | 92 | 56 | 74.3 | 4.41 | Mahoning..... | 91 | 42 | 68.8 | 1.76 |
| Hiram..... | 88 | 44 | 68.8 | 2.59 | Mauch Chunk..... | 93 | 44 | 68.8 | 5.25 |
| Hudson..... | 95 | 50 | 75.6 | 5.60 | McConnellsburgh..... | 91 | 42 | 70.2 | 4.87 |
| Jacksonborough..... | 90 | 42 | 67.9 | 5.29 | Meadville (2)..... | 86 | 50 | 67.5 | 1.92 |
| Jefferson..... | 95 | 45 | 73.0 | 6.54 | Myersville..... | 95 | 47 | 70.5 | 2.50 |
| Kenton..... | 90 | 42 | 67.9 | 5.29 | New Castle..... | 91 | 38 | 73.4 | 2.65 |
| Leipsic..... | 97 | 54 | 77.5 | 3.16 | Niabet..... | 98 | 58 | 69.8 | 3.60 |
| Logan..... | 98 | 49 | 73.8 | 3.74 | Oil City..... | 92 | 42 | 68.8 | 4.92 |
| Lordstown..... | 92 | 39 | 67.5 | 2.57 | Ottaville..... | 92 | 42 | 68.8 | 5.12 |
| Mansfield..... | 92 | 39 | 67.5 | 2.57 | Parker's Landing..... | 95 | 42 | 69.9 | 2.08 |
| Marietta (1)..... | 90 | 42 | 73.6 | 3.45 | Petersburgh..... | 95 | 42 | 69.9 | 3.27 |
| Marietta (2)..... | 90 | 42 | 73.6 | 3.45 | Philadelphia..... | 92 | 37 | 68.0 | 1.30 |
| McConnellsville..... | 91 | 48 | 74.9 | 5.33 | Philipsburgh..... | 92 | 37 | 68.0 | 2.73 |
| Napoleon..... | 96 | 45 | 75.7 | 5.95 | Pleasant Mount..... | 92 | 37 | 68.0 | 5.20 |
| New Alexandria..... | 90 | 45 | 71.8 | 3.97 | Point Pleasant..... | 94 | 51 | 72.2 | 3.58 |
| New Comerstown..... | 92 | 44 | 70.1 | 1.85 | Portstown..... | 94 | 51 | 72.2 | 2.11 |
| North Lewisburgh..... | 100 | 49 | 77.5 | 1.85 | Quakertown..... | 90 | 45 | 69.2 | 3.13 |
| Oberlin..... | 90 | 47 | 70.8 | 3.26 | Salem Corners..... | 85 | 46 | 65.4 | 4.87 |
| O. B. University..... | 94 | 48 | 73.4 | 3.43 | Salisbury..... | 92 | 42 | 68.8 | 2.96 |
| Orangeville..... | 94 | 36 | 69.8 | 2.85 | Seisholtzville..... | 92 | 42 | 68.8 | 2.61 |
| Pomeroy..... | 99 | 51 | 79.4 | 2.03 | Selin's Grove..... | 92 | 42 | 68.8 | 1.36 |
| Portsmouth (1)..... | 90 | 42 | 73.6 | 3.45 | Smith's Corners..... | 92 | 42 | 68.8 | 3.89 |
| Portsmouth (2)..... | 98 | 51 | 75.5 | 4.23 | Somerseset..... | 86 | 45 | 68.1 | 4.93 |
| Shiloh..... | 93 | 51 | 70.4 | 2.75 | South Easton..... | 87 | 44 | 67.5 | 2.81 |
| Springborough..... | 100 | 49 | 72.5 | 6.96 | State College..... | 88 | 43 | 68.8 | 2.34 |
| Tiffin..... | 100 | 49 | 72.5 | 6.96 | Tipton..... | 107 | 53 | 71.3 | 1.86 |
| Upper Sandusky..... | 93 | 52 | 72.9 | 5.94 | Troy..... | 88 | 48 | 67.1 | 3.53 |
| Vienna..... | 93 | 43 | 71.4 | 1.75 | Tuscarora..... | 97 | 60 | 75.1 | 2.84 |
| Wapakoneta..... | 101 | 45 | 75.2 | 1.04 | Uniontown..... | 91 | 43 | 73.7 | 4.33 |
| Wauseon..... | 96 | 39 | 72.2 | 3.88 | Warren..... | 92 | 42 | 68.8 | 4.71 |
| Waverly..... | 95 | 53 | 76.7 | 5.93 | Waynesburgh..... | 93 | 40 | 70.7 | 3.85 |
| Wayneville..... | 92 | 53 | 85.2 | 4.50 | Wellsborough..... | 90 | 40 | 64.5 | 5.14 |
| Westerville..... | 92 | 48 | 71.9 | 3.46 | West Chester..... | 90 | 51 | 71.5 | 2.42 |
| West Milton..... | 100 | 50 | 77.7 | 4.64 | Westtown..... | 89 | 50 | 72.2 | 2.83 |
| Weymouth..... | 92 | 28 | 67.8 | 3.85 | Wilkes Barre..... | 91 | 42 | 71.0 | 5.07 |
| Wooster..... | 88 | 46 | 69.8 | 4.92 | Wysox..... | 90 | 40 | 67.2 | 4.75 |
| Yellow Springs..... | 94 | 52 | 73.9 | 3.26 | York..... | 94 | 46 | 71.2 | 3.29 |
| Youngstown..... | 90 | 48 | 71.9 | 2.83 | | | | | |
| Zanesville..... | 90 | 48 | 71.9 | 2.83 | | | | | |
| <i>Oregon.</i> | | | | 7.51 | <i>Rhode Island.</i> | | | | |
| Albany..... | 95 | 40 | 63.3 | 1.41 | Bristol..... | 85 | 48 | 63.7 | 5.17 |
| Ashland (1)..... | 93 | 43 | 62.2 | 0.55 | Port Adams..... | 83 | 46 | 62.6 | 4.84 |
| Clandon..... | 72 | 48 | 57.8 | 1.08 | Kingston (1)..... | 86 | 43 | 63.1 | 3.98 |
| Burns..... | 92 | 30 | 50.8 | 0.00 | Kingston (2)..... | 86 | 47 | 63.6 | 4.00 |
| East Portland..... | 90 | 46 | 62.2 | 2.06 | Lonsdale..... | 92 | 42 | 68.8 | 2.62 |
| Ellensburg..... | 83 | 41 | 55.9 | 2.69 | Newport..... | 86 | 53 | 65.6 | ..... |
| Eola..... | 92 | 39 | 58.0 | 1.18 | Olneyville..... | 85 | 51 | 66.1 | ..... |
| Grant's Pass..... | 103 | 36 | 62.2 | 2.10 | Pawtucket..... | 92 | 42 | 68.8 | 2.84 |
| Heppner..... | 99 | 36 | 61.3 | 2.26 | Providence (1)..... | 88 | 50 | 65.9 | 2.68 |
| Jordan Valley..... | 91 | 26 | 56.5 | 0.49 | Providence (2)..... | 88 | 44 | 65.5 | 2.45 |
| Joseph..... | 86 | 32 | 53.4 | 3.21 | <i>South Carolina.</i> | | | | |
| Lakeview..... | 96 | 29 | 57.2 | 1.83 | Allendale..... | 100 | 65 | 82.3 | 2.65 |
| McMinnville..... | 94 | 35 | 58.8 | 0.27 | Batesburgh..... | 100 | 64 | 81.8 | 4.27 |
| Mount Angel..... | 92 | 43 | 61.7 | 2.10 | Belmont..... | 97 | 64 | 79.6 | 1.22 |
| Niskiyou..... | 90 | 40 | 58.7 | 0.36 | Blackville..... | 100 | 66 | 83.4 | 1.66 |
| <i>Pennsylvania.</i> | | | | | Branchville..... | 102 | 62 | 81.2 | 3.33 |
| Allegheny Arsenal..... | 94 | 46 | 73.3 | 3.86 | Cheraw..... | 103 | 61 | 82.5 | 0.92 |
| Altoona..... | 93 | 47 | 73.1 | 2.52 | Chester..... | 102 | 72 | 87.5 | 0.73 |
| Anrville..... | 94 | 56 | 75.9 | ..... | Conway..... | 97 | 66 | 80.8 | 1.43 |
| Aqueduct..... | 90 | 50 | 73.5 | 4.02 | Evergreen..... | 97 | 62 | 78.0 | 3.29 |
| Bethlehem..... | 94 | 50 | 73.1 | 3.10 | Florence..... | 100 | 62 | 81.9 | 3.24 |
| Blooming Grove..... | 94 | 54 | 70.4 | 4.80 | Greenville..... | 96 | 60 | 77.9 | 3.32 |
| Blue Knob..... | 90 | 44 | 70.1 | 4.50 | Greenwood..... | 102 | 60 | 80.6 | 0.78 |
| Brookville..... | 90 | 44 | 70.1 | 4.50 | Hardeville..... | 98 | 64 | 80.8 | 3.90 |
| Cannonsburgh..... | 92 | 42 | 70.7 | 1.82 | Jacksonsburgh..... | 100 | 60 | 81.6 | 3.37 |
| Carlisle..... | 97 | 44 | 72.2 | 2.90 | Kingstree..... | 100 | 59 | 81.0 | 1.81 |
| Catawissa..... | 90 | 50 | 71.0 | 2.72 | Kirkwood..... | 97 | 61 | 77.2 | 2.27 |
| Charlesville..... | 91 | 33 | 70.0 | 1.87 | McCormick..... | 97 | 62 | 78.0 | 2.37 |
| Clarion (1)..... | 90 | 42 | 70.0 | 2.36 | Port Royal..... | 97 | 73 | 83.4 | 2.31 |
| Coatesville..... | 94 | 48 | 71.5 | 3.07 | Saint George's..... | 100 | 64 | 81.1 | 3.34 |
| Confluence..... | 90 | 50 | 70.0 | 3.38 | Saint Matthew's..... | 98 | 64 | 80.8 | 3.78 |
| Coopersburgh..... | 90 | 50 | 70.0 | 3.14 | Simpsonville..... | 102 | 62 | 80.5 | 5.71 |
| Corry..... | 90 | 34 | 67.5 | 5.66 | Spartanburgh (1)..... | 99 | 56 | 79.4 | 2.05 |
| Doylestown..... | 90 | 50 | 70.0 | 3.14 | Spartanburgh (2)..... | 94 | 60 | 76.2 | 3.26 |
| Dyberry..... | 86 | 38 | 64.0 | 4.24 | Statesburg..... | 95 | 66 | 78.5 | 2.65 |
| Eagle's Mere..... | 80 | 42 | 65.4 | 3.72 | Timmons ville..... | 95 | 69 | 82.8 | 0.95 |
| Easton..... | 90 | 62 | 70.0 | 4.72 | Frial..... | 99 | 68 | 82.0 | 3.19 |
| Edinborough..... | 90 | 44 | 67.9 | ..... | Walhalla..... | 88 | 68 | 76.6 | 3.37 |
| Emporium..... | 91 | 30 | 71.7 | 4.85 | Yorkville..... | 97 | 61 | 79.0 | 2.76 |
| F's of Neshaminy..... | 87 | 58 | 70.8 | 5.74 | <i>South Dakota.</i> | | | | |
| Franklin..... | 88 | 44 | 67.6 | 2.90 | Aberdeen..... | 96 | 30 | 67.4 | 7.56 |
| Frankford Arsenal..... | 94 | 50 | 72.5 | 2.60 | Alexandria..... | 98 | 45 | 71.2 | 4.24 |
| Frederick..... | 90 | 44 | 70.0 | 2.78 | Brookings..... | 90 | 39 | 66.9 | 7.91 |
| Freeport..... | 90 | 44 | 70.0 | 3.95 | Canton..... | 98 | 47 | 71.2 | 3.91 |
| Germantown..... | 89 | 60 | 71.6 | 2.27 | Clark..... | 95 | 43 | 67.4 | 6.28 |
| Gettysburgh..... | 94 | 42 | 70.3 | 3.91 | Cross..... | 97 | 40 | 61.7 | 2.56 |
| Girardville..... | 90 | 47 | 70.0 | 4.56 | De Smet..... | 92 | 52 | 68.6 | 5.35 |
| Grampan Hills..... | 90 | 40 | 70.0 | 2.74 | Flandreau..... | 94 | 43 | 69.4 | 5.98 |
| Greensborough..... | 90 | 40 | 70.0 | 5.38 | Fort Bennett..... | 102 | 42 | 71.2 | 4.41 |
| Greenville..... | 89 | 43 | 67.8 | 3.44 | Fort Meade..... | 96 | 43 | 65.6 | 6.30 |
| Holidaysburgh..... | 95 | 40 | 71.0 | 4.30 | Fort Randall..... | 96 | 49 | 71.1 | 2.37 |
| Honesdale..... | 87 | 44 | 66.2 | 4.14 | Fort Sully..... | 99 | 50 | 71.8 | 6.29 |
| Huntingdon..... | 93 | 39 | 73.7 | 4.18 | Highmore..... | 96 | 36 | 68.8 | 6.17 |
| Johnstown..... | 88 | 41 | 69.9 | 2.72 | Kimball..... | 97 | 44 | 70.8 | 3.07 |
| Kennett Square..... | 84 | 57 | 70.5 | 2.59 | Milbank..... | 98 | 54 | 68.6 | 10.53 |
| Lancaster..... | 92 | 46 | 70.4 | 2.20 | Seranton..... | 97 | 54 | 70.4 | 9.74 |
| Lansdale..... | 90 | 42 | 68.1 | 4.37 | Sioux Falls..... | 92 | 52 | 72.2 | 3.70 |
| Le Roy..... | 90 | 43 | 68.1 | 4.37 | Spearfish..... | 96 | 44 | 68.0 | 6.81 |
| Lewisburgh..... | 94 | 45 | 71.9 | 2.80 | Vermillion..... | 97 | 48 | 71.4 | 2.19 |
| | | | | | Webster..... | 88 | 44 | 69.1 | 9.31 |
| | | | | | Wolsey..... | 95 | 50 | 71.1 | 1.98 |
| | | | | | Woonsocket..... | 99 | 42 | 69.4 | 4.44 |

Meteorological record of voluntary observers, &c.—Continued.

| Stations. | Temperature. (Fahrenheit.) | | | Precip'n. | Stations. | Temperature. (Fahrenheit.) | | | Precip'n. |
|------------------------|-------------------------------|------|-------|-------------|-------------------------|-------------------------------|------|-------|-------------|
| | Max. | Min. | Mean. | | | Max. | Min. | Mean. | |
| <i>Tennessee.</i> | ° | ° | ° | <i>Ins.</i> | <i>Texas—Cont'd.</i> | ° | ° | ° | <i>Ins.</i> |
| Andersonville..... | 93 | 58 | 76.2 | 2.95 | Santa Maria..... | 97 | 52 | 76.1 | 3.18 |
| Arlington..... | 98 | 56 | 76.3 | 4.95 | Silver Falls..... | 100 | 58 | 81.0 | 3.19 |
| Ashwood*..... | 96 | 65 | 78.6 | 2.51 | Tyler..... | 99 | 58 | 80.9 | 2.50 |
| Austin..... | 96 | 64 | 78.6 | 4.68 | Waco (2)..... | 98 | 48 | 79.3 | 0.73 |
| Bolivar (1) m..... | 94 | 74 | 80.9 | 1.27 | <i>Utah.</i> | | | | |
| Bolivar (2)..... | 92 | 60 | 78.2 | 3.70 | Beaver..... | 98 | 39 | 60.9 | T. |
| Brownsville..... | 100 | 62 | 81.6 | 4.76 | Blue Creek..... | 98 | 49 | 73.4 | 0.40 |
| Carthage..... | 98 | 60 | 79.8 | 3.25 | Corinne..... | 91 | 45 | 70.5 | 0.00 |
| Charleston..... | 98 | 60 | 79.8 | 3.25 | Fort Douglas..... | 99 | 38 | 64.6 | 0.43 |
| Clarksville..... | 98 | 60 | 79.8 | 3.25 | Fort DuChesne..... | 93 | 32 | 63.6 | 0.00 |
| Clinton..... | 100 | 65 | 80.0 | 1.90 | Grouse Creek..... | 93 | 32 | 63.6 | 0.00 |
| Cog Hill..... | 100 | 65 | 80.0 | 1.90 | Kelton..... | 93 | 49 | 70.6 | 0.15 |
| Columbia..... | 91 | 66 | 78.4 | 6.98 | Losef..... | 97 | 42 | 63.0 | 0.00 |
| Covington (1)..... | 91 | 66 | 78.4 | 6.98 | Mount Carmel..... | 97 | 34 | 51.6 | T. |
| Covington (2)..... | 91 | 66 | 78.4 | 6.98 | Mount Pleasant..... | 73 | 26 | 50.8 | 0.26 |
| Cumberland Gap..... | 86 | 56 | 75.8 | 8.36 | Nepht..... | 90 | 30 | 61.8 | 0.17 |
| Dunlap..... | 99 | 57 | 82.0 | 2.41 | Ogden (1)..... | 96 | 36 | 61.8 | 0.54 |
| Dyersburg..... | 104 | 57 | 78.2 | 3.96 | Ogden (2)..... | 90 | 44 | 71.7 | 0.56 |
| Fayetteville..... | 98 | 68 | 78.5 | 4.49 | Price..... | 90 | 44 | 71.7 | 0.56 |
| Florence Station..... | 94 | 68 | 78.5 | 4.49 | Promontory..... | 90 | 46 | 72.8 | 0.00 |
| Greeneville..... | 94 | 68 | 78.5 | 4.49 | Richfield..... | 90 | 46 | 72.8 | 0.00 |
| Greenville..... | 94 | 68 | 78.5 | 4.49 | Saint George..... | 104 | 54 | 78.8 | 0.12 |
| Grief..... | 89 | 58 | 74.1 | 2.39 | Snowville..... | 82 | 34 | 62.6 | 0.12 |
| Hohenwald..... | 102 | 58 | 78.7 | 3.97 | Terrace..... | 96 | 47 | 71.8 | 0.15 |
| Jacksborough..... | 91 | 56 | 75.1 | 3.37 | <i>Vermont.</i> | | | | |
| Johnsonville..... | 91 | 56 | 75.1 | 3.37 | Brattleborough (1)..... | 90 | 39 | 65.8 | 2.77 |
| Kingston (1)..... | 91 | 56 | 75.1 | 3.37 | Brattleborough (2)..... | 85 | 41 | 64.2 | 2.77 |
| Lawrenceburgh..... | 95 | 63 | 79.0 | 4.16 | Burlington..... | 86 | 44 | 64.2 | 2.77 |
| Lewisburgh..... | 95 | 63 | 79.0 | 4.16 | Chelsea..... | 76 | 44 | 59.8 | 3.11 |
| Loudon..... | 95 | 63 | 79.0 | 4.16 | Cornwall..... | 86 | 33 | 62.2 | 3.64 |
| Lynnville..... | 95 | 63 | 79.0 | 4.16 | East Berkshire..... | 88 | 36 | 62.0 | 2.75 |
| McKenzie..... | 93 | 68 | 81.0 | 2.13 | Hartland..... | 88 | 36 | 62.0 | 2.75 |
| Milan (2)..... | 100 | 59 | 81.3 | 4.79 | Jacksonville..... | 82 | 44 | 62.6 | 4.57 |
| Missary Ridge..... | 91 | 71 | 77.8 | 2.87 | Lunenburg..... | 84 | 46 | 63.8 | 2.90 |
| Nunnally..... | 95 | 64 | 78.0 | 3.97 | Stratford..... | 86 | 50 | 65.5 | 1.83 |
| Parksville..... | 98 | 59 | 76.4 | 4.16 | Weatherfield C'tre..... | 83 | 42 | 61.7 | 1.74 |
| Riddleton..... | 98 | 60 | 78.5 | 4.28 | <i>Virginia.</i> | | | | |
| Rockwood..... | 91 | 64 | 75.1 | 2.28 | Abingdon..... | 93 | 50 | 75.6 | 1.67 |
| Rogersville..... | 91 | 64 | 75.1 | 2.28 | Alexandria..... | 89 | 62 | 76.3 | 2.15 |
| Savannah..... | 95 | 62 | 80.3 | 4.54 | Birdsneat..... | 82 | 43 | 62.9 | 3.62 |
| Sharp's..... | 98 | 68 | 80.3 | 3.63 | Bolton..... | 92 | 37 | 67.4 | 2.60 |
| Springdale..... | 95 | 60 | 76.4 | 2.22 | Christiansburg..... | 90 | 45 | 78.5 | 5.01 |
| Strawberry Plain..... | 95 | 60 | 76.4 | 2.22 | Dale Enterprise..... | 98 | 60 | 79.3 | 2.44 |
| Trenton..... | 91 | 63 | 77.3 | 4.85 | Full Creek Depot..... | 94 | 59 | 77.5 | 1.27 |
| Watkins..... | 102 | 68 | 80.4 | 1.65 | Fort Monroe..... | 91 | 49 | 73.0 | 2.34 |
| Waynesborough..... | 97 | 60 | 75.8 | 3.60 | Fort Myer..... | 94 | 46 | 73.8 | 5.04 |
| Woodstock..... | 98 | 69 | 81.0 | 2.70 | Liberty..... | 65 | 78.7 | 2.61 | |
| <i>Texas.</i> | | | | | Marion..... | 90 | 48 | 72.5 | 1.31 |
| Austin (1)..... | 95 | 66 | 82.0 | 4.70 | Mossingford..... | 67 | 77.0 | 2.77 | |
| Austin (2)..... | 96 | 59 | 77.2 | 2.11 | Nottaway C. H..... | 102 | 54 | 77.1 | 3.03 |
| Belton..... | 98 | 53 | 80.2 | 2.11 | Petersburg..... | 96 | 57 | 78.3 | 1.95 |
| Brady..... | 94 | 54 | 76.9 | 2.05 | Richmond..... | 96 | 53 | 78.0 | 1.52 |
| Brazoria..... | 93 | 61 | 79.0 | 7.24 | Salem..... | 92 | 54 | 77.1 | 5.44 |
| Brenham..... | 97 | 60 | 81.1 | 5.54 | Smithfield..... | 90 | 54 | 74.1 | 2.59 |
| Brownwood..... | 100 | 55 | 81.1 | 1.38 | Staunton..... | 94 | 49 | 73.0 | 3.75 |
| Burnet..... | 90 | 58 | 78.2 | 4.35 | Summit..... | 91 | 45 | 71.5 | 3.75 |
| Camp del Rio..... | 103 | 55 | 76.6 | 0.75 | Woodstock..... | 88 | 52 | 71.9 | 1.36 |
| Camp Eagle Pass..... | 101 | 60 | 80.9 | 6.15 | <i>Washington.</i> | | | | |
| C'p Pena Colorado..... | 103 | 43 | 75.1 | 2.23 | Blakeley..... | 86 | 42 | 59.6 | 1.61 |
| Childress..... | 100 | 60 | 82.8 | 0.44 | Chehalis..... | 94 | 37 | 59.2 | 1.87 |
| College Station..... | 97 | 61 | 77.8 | 4.95 | Doe Bay..... | 72 | 42 | 55.5 | 2.39 |
| Colorado..... | 100 | 50 | 75.7 | 1.32 | East Sound..... | 76 | 46 | 59.2 | 2.63 |
| Columbia..... | 97 | 63 | 80.8 | 7.22 | Fort Canby..... | 75 | 30 | 56.9 | 3.45 |
| Corsicana (1)..... | 103 | 54 | 77.3 | 2.07 | Fort Simcoe..... | 97 | 51 | 65.4 | 0.00 |
| Corsicana (2)..... | 96 | 56 | 79.8 | 1.80 | Fort Spokane..... | 96 | 37 | 67.6 | 2.65 |
| Cuero..... | 100 | 60 | 80.8 | 5.99 | Fort Townsend..... | 78 | 38 | 56.3 | 1.59 |
| Dallas (1)..... | 101 | 65 | 83.3 | 0.30 | Fort Walla Walla..... | 98 | 42 | 64.4 | 1.59 |
| Dallas (2)..... | 100 | 58 | 82.5 | 1.28 | Lapush..... | 67 | 43 | 51.9 | 5.22 |
| Durham..... | 97 | 62 | 80.8 | 3.60 | North Yakima..... | 102 | 38 | 64.3 | 0.25 |
| Duval..... | 97 | 62 | 80.8 | 3.60 | Vancouver B'ks..... | 95 | 34 | 56.7 | 2.43 |
| Edinburgh..... | 97 | 62 | 80.8 | 3.60 | Waterville..... | 98 | 34 | 60.1 | 1.52 |
| Epworth..... | 93 | 52 | 75.2 | 2.37 | <i>West Indies.</i> | | | | |
| Forestburg..... | 103 | 54 | 80.2 | 2.53 | Grand Turk Island..... | 83 | 80 | 81.2 | 0.15 |
| Fort Bliss..... | 103 | 54 | 80.2 | 2.53 | Hamilton, Bermuda..... | 80 | 65 | 75.2 | 8.58 |
| Fort Brown..... | 90 | 56 | 77.2 | 0.20 | <i>West Virginia.</i> | | | | |
| Fort Clark..... | 98 | 60 | 80.6 | 2.35 | Buckhannon..... | 86 | 55 | 70.7 | 7.10 |
| Fort Davis..... | 96 | 48 | 73.8 | 3.64 | Charleston..... | 86 | 55 | 70.7 | 7.10 |
| Fort Elliott..... | 98 | 51 | 75.8 | 1.56 | Ella..... | 86 | 55 | 70.7 | 7.10 |
| Fort Hancock..... | 107 | 45 | 79.1 | 0.34 | Glenville..... | 86 | 55 | 70.7 | 7.10 |
| Fort McIntosh..... | 100 | 58 | 81.0 | 2.48 | Harper's Ferry..... | 86 | 55 | 70.7 | 7.10 |
| Fredericksburgh..... | 94 | 60 | 75.5 | 3.30 | Hinton..... | 86 | 55 | 70.7 | 7.10 |
| Gallinas..... | 98 | 53 | 77.4 | 3.59 | Kingwood..... | 95 | 50 | 66.0 | 0.00 |
| Graham..... | 102 | 51 | 79.7 | 0.05 | Mount Alto..... | 98 | 48 | 67.9 | 0.00 |
| Grapevine..... | 97 | 72 | 83.3 | 0.50 | Morgantown..... | 93 | 58 | 73.7 | 4.62 |
| Hartley..... | 97 | 68 | 70.3 | 1.50 | Oceana..... | 93 | 58 | 73.7 | 4.62 |
| Haskell..... | 103 | 63 | 82.5 | 0.00 | Pleasant Hill..... | 88 | 38 | 68.5 | 2.82 |
| Hearne..... | 96 | 58 | 77.4 | 2.00 | Point Pleasant..... | 86 | 48 | 71.0 | 4.67 |
| Houston..... | 99 | 59 | 81.4 | 5.79 | Rowlesburg (1)..... | 86 | 48 | 71.0 | 4.67 |
| Howe..... | 101 | 59 | 78.7 | 1.56 | Seven Pines..... | 90 | 46 | 69.7 | 3.45 |
| Huntsville..... | 97 | 58 | 80.4 | 3.24 | Tannery..... | 98 | 63 | 74.8 | 3.45 |
| La Grange..... | 97 | 58 | 80.4 | 3.24 | Tyler Creek..... | 98 | 63 | 74.8 | 3.45 |
| Longview..... | 101 | 59 | 81.4 | 3.04 | Weston..... | 98 | 63 | 74.8 | 3.45 |
| Luling..... | 98 | 60 | 79.2 | 3.75 | Wheeling..... | 98 | 63 | 74.8 | 3.45 |
| Menardville..... | 95 | 58 | 75.5 | 2.86 | White Sulph' Sp'gs..... | 98 | 63 | 74.8 | 3.45 |
| Merkel..... | 103 | 61 | 76.7 | 0.83 | <i>Wisconsin.</i> | | | | |
| Mesquite..... | 103 | 55 | 81.0 | 0.23 | Butternut..... | 40 | 64.6 | 3.77 | |
| Miami..... | 98 | 58 | 80.4 | 4.87 | Cadiz..... | 52 | 71.8 | 10.96 | |
| New Ulm..... | 98 | 58 | 80.4 | 4.87 | Chippewa Falls..... | 49 | 71.4 | 6.60 | |
| Ochiltree..... | 98 | 58 | 80.4 | 4.87 | Embarrass..... | 92 | 50 | 71.4 | 6.60 |
| Orange..... | 94 | 60 | 78.7 | 1.70 | Fond du Lac..... | 96 | 43 | 69.9 | 3.47 |
| Panhandle..... | 96 | 49 | 74.7 | 1.36 | Grantsburg..... | 103 | 45 | 66.6 | 10.76 |
| Paris..... | 102 | 54 | 80.0 | 1.36 | | | | | |
| Pike..... | 106 | 50 | 81.0 | 0.71 | | | | | |
| Round Rock..... | 96 | 62 | 80.5 | 2.92 | | | | | |
| San Antonio..... | 94 | 58 | 78.7 | 2.24 | | | | | |

Meteorological record of voluntary observers, &c.—Continued.

| Stations. | Temperature. (Fahrenheit.) | | | Precip'n. | Stations. | Temperature. (Fahrenheit.) | | | Precip'n. |
|--------------------------|-------------------------------|------|-------|-------------|-----------------------------|-------------------------------|------|-------|-------------|
| | Max. | Min. | Mean. | | | Max. | Min. | Mean. | |
| <i>Wisconsin—Cont'd.</i> | ° | ° | ° | <i>Ins.</i> | <i>Wyoming.</i> | ° | ° | ° | <i>Ins.</i> |
| Greenwood..... | 98 | 43 | 67.7 | 5.47 | Camp Pilot Butte..... | 85 | 28 | 56.7 | 0.07 |
| Honey Creek..... | 99 | 50 | 73.4 | 6.00 | Camp Sheridan..... | 87 | 29 | 54.5 | 0.90 |
| Lincoln..... | 99 | 50 | 69.6 | 5.32 | Fort Bridger..... | 85 | 26 | 55.2 | 0.16 |
| Madison..... | 93 | 50 | 70.6 | 7.73 | Fort D. A. Russell..... | 100 | 25 | 62.0 | 0.41 |
| Manitowish..... | 94 | 40 | 68.2 | 4.00 | Fort Fetterman..... | 104 | 32 | 67.1 | T. |
| Medford..... | 102 | 40 | 68.2 | 4.50 | Fort McKinney..... | 87 | 39 | 62.0 | 1.80 |
| Neillsville..... | 102 | 40 | 68.2 | 4.50 | Fort Washakie..... | 85 | 32 | 60.3 | 0.03 |
| Oshkosh..... | 95 | 52 | 70.2 | 7.62 | Owen..... | 88 | 52 | 58.8 | 0.11 |
| Phillips..... | 95 | 52 | 70.2 | 7.62 | Saratoga..... | 88 | 37 | 61.2 | 1.00 |
| Portage..... | 95 | 52 | 70.2 | 7.62 | Wheatland..... | 84 | 33 | 59.0 | 0.00 |
| Potosi..... | 94 | 57 | 74.8 | 10.40 | <i>Colony Surinam, S.A.</i> | | | | |
| Summit Lake..... | 102 | 46 | 71.5 | 10.00 | Burnside-Coronia..... | 88 | 73 | 78.3 | 9.75 |
| Waukegan..... | 40 | 67.2 | 1.04 | | <i>Sandwich Islands.</i> | | | | |
| Weston..... | 53 | 65.3 | 1.04 | | Honolulu..... | 85 | 70 | 76.3 | 1.88 |

Reports received too late for general discussion of weather for June, 1890.

| | | | | | | | | | |
|----------------------|-----|----|------|-------|-------------------|-----|----|------|------|
| Arizona. | | | | | New York—Cont'd. | | | | |
| Ariz. Canal Co. Dam. | | | | 0.00 | Cherry Creek | | | | 3.46 |
| Calabasas | | | | 0.00 | Chittenden | | | | 5.66 |
| Arkansas. | | | | | De Kalb Junction | | | | |
| Camden | 91 | 61 | 76.9 | ..... | Demster | | | | 3.99 |
| Conway | 92 | 64 | 78.9 | 3.81 | Deposit | | | | 2.48 |
| Dallas | 96 | 59 | 76.4 | 4.22 | Dunkirk | | | | 4.65 |
| Harrisburgh | 93 | 64 | 78.2 | 2.89 | Hammondsport | | | | 2.86 |
| Heber | 96 | 59 | 76.4 | 3.80 | Kingston | 95 | 40 | 67.5 | 3.36 |
| Lonoke | 100 | 61 | 80.8 | 6.06 | Liberty | | | | 1.96 |
| Osceola | 94 | 60 | 79.3 | 3.12 | Lowville | | | | 5.57 |
| Ozone | 91 | 58 | 75.8 | 2.58 | Lyndonville | | | | 3.68 |
| Stuttgart | 96 | 62 | 79.4 | 3.48 | Lyon Mountain | | | | 3.96 |
| Washington | 91 | 60 | 76.2 | 4.72 | McLean | | | | 1.50 |
| California. | | | | | Mount Morris | | | | |
| Walnut Creek | 98 | 48 | 66.0 | ..... | Newark Valley | | | | 2.71 |
| Colorado. | | | | | Norwood | | | | |
| Idaho Springs | 84 | 36 | 58.0 | 0.38 | Pawling | | | | 4.74 |
| Longmont | 98 | 37 | 68.0 | 0.19 | Pine City | | | | 4.15 |
| Greeley | 97 | 34 | 66.4 | 0.14 | Shodaek Depot | | | | 3.88 |
| Parachute | | | | T. | Wappinger's Falls | | | | 3.66 |
| Florida. | | | | | West Camden | | | | |
| Archer | 104 | 64 | 82.2 | 2.33 | Oregon. | | | | |
| Illinois. | | | | | Ashland (2)* | | | | |
| South Evanston | 96 | 42 | 69.0 | 5.94 | Beulah | 99 | 37 | 60.6 | 0.6 |
| Montana. | | | | | Corvallis | | | | |
| Sheldon | 92 | 44 | 60.5 | 3.10 | Diamond | 92 | 25 | 56.6 | 0.35 |
| New Mexico. | | | | | Forest Grove | | | | |
| Antelope Springs | | | | 0.20 | Gardiner | 95 | 38 | 60.2 | 1.23 |
| El Rito | | | | 0.00 | Hood River | 91 | 27 | 56.5 | 1.75 |
| Embudo | | | | 0.43 | Hubbard | 98 | 39 | 60.2 | 1.34 |
| Magdalena | | | | 0.20 | Jacksonville | 75 | 42 | 58.8 | 2.86 |
| Pojuaque | | | | 0.02 | La Grande | 97 | 44 | 63.7 | 0.47 |
| San Marcial | | | | 0.00 | Lone Rock | 91 | 46 | 60.7 | 1.57 |
| New York. | | | | | North Powder | | | | |
| Adams Centre | | | | 2.38 | Pendleton | 96 | 36 | 61.2 | 0.38 |
| Afton | | | | 2.86 | Toledo | 92 | 40 | 59.1 | 2.64 |
| Akron | | | | 6.58 | The Dalles | 90 | 28 | 55.4 | 1.97 |
| Albion | | | | 4.96 | Vernonia | 89 | 31 | 54.4 | 1.51 |
| Apulia | | | | 5.93 | South Dakota. | | | | |
| Attica | | | | 4.31 | Parkston | 92 | 46 | 68.4 | 3.20 |
| Au Sable Forks | | | | 2.88 | Texas. | | | | |
| Avon | | | | 3.49 | Lampasas | 98 | 53 | 77.0 | 3.03 |
| Batavia | | | | 3.37 | Utah. | | | | |
| Bethlehem Centre | | | | 3.60 | Levan | | 45 | 62.4 | 0.10 |
| Blood's Depot | | | | 4.18 | Mexico. | | | | |
| Bolivar | | | | 2.94 | La Logia | 102 | 65 | 84.8 | 0.63 |
| Cen. Park, N.Y. City | 90 | 54 | 70.1 | 4.67 | Mazatlan | 89 | 76 | 83.3 | 3.96 |
| Chenango Forks | | | | 5.90 | Mexico | 83 | 51 | 63.8 | 5.67 |

Monthly normal rainfall and temperature and departures therefrom at New Ulm, Tex., deduced from eighteen years record, beginning January 1, 1873, and ending June 30, 1890, by C. Runge, voluntary observer. Plus departures are given without sign.

RAINFALL (in inches and hundredths).

| Year. | January. | | February. | | March. | | April. | | May. | | June. | |
|-----------|---------------|------------------------|---------------|------------------------|---------------|------------------------|---------------|------------------------|---------------|------------------------|---------------|------------------------|
| | Monthly mean. | Departure from normal. | Monthly mean. | Departure from normal. | Monthly mean. | Departure from normal. | Monthly mean. | Departure from normal. | Monthly mean. | Departure from normal. | Monthly mean. | Departure from normal. |
| 1873..... | 6.00 | 1.69 | 2.15 | -2.21 | 4.80 | 0.08 | 8.00 | 4.06 | 1.88 | -3.33 | 11.33 | 7.27 |
| 1874..... | 2.23 | -2.08 | 6.94 | 2.58 | 8.45 | 3.73 | 4.30 | 0.36 | 2.90 | -2.31 | 3.70 | -0.35 |
| 1875..... | 3.68 | -0.63 | 7.00 | 2.64 | 2.56 | -2.16 | 5.06 | 1.12 | 4.23 | -0.98 | 1.89 | -2.27 |
| 1876..... | 3.43 | -0.98 | 2.40 | -1.96 | 7.15 | 2.43 | 1.08 | -2.86 | 6.13 | -0.93 | 3.13 | -0.98 |
| 1877..... | 1.13 | -3.18 | 6.75 | 2.39 | 4.25 | -0.47 | 5.94 | 2.00 | 4.50 | -0.71 | 9.00 | 4.89 |
| 1878..... | 4.88 | 0.57 | 3.56 | -0.80 | 2.35 | -2.37 | 1.88 | -2.06 | 3.56 | -1.65 | 4.38 | 0.27 |
| 1879..... | 4.38 | 0.07 | 1.13 | -3.23 | 3.96 | -0.76 | 6.44 | 2.50 | 3.19 | -2.02 | 3.06 | -1.05 |
| 1880..... | 6.44 | 2.13 | 7.15 | 2.79 | 9.13 | 4.41 | 4.13 | 0.19 | 6.22 | 1.01 | 4.59 | 0.48 |
| 1881..... | 1.75 | -2.96 | 8.31 | 3.95 | 2.44 | -2.28 | 2.75 | -1.19 | 4.63 | -0.58 | 0.63 | -2.48 |
| 1882..... | 10.56 | 6.25 | 10.94 | 6.58 | 4.81 | 0.09 | 2.94 | -1.00 | 12.25 | 7.04 | 0.81 | 3.30 |
| 1883..... | 7.72 | 3.41 | 4.31 | -0.05 | 13.13 | 8.41 | 2.54 | -1.40 | 3.07 | -2.14 | 3.38 | -0.73 |
| 1884..... | 3.43 | -0.88 | 2.58 | -1.78 | 4.86 | 0.16 | 4.68 | 0.74 | 15.25 | 10.04 | 2.82 | 1.29 |
| 1885..... | 4.31 | 0.00 | 1.05 | -3.30 | 2.14 | -2.58 | 5.71 | 1.77 | 8.01 | 2.80 | 0.51 | 3.60 |
| 1886..... | 1.13 | -3.18 | 1.65 | -2.71 | 4.75 | -0.03 | 2.01 | -1.93 | 0.05 | -3.16 | 0.68 | -3.43 |
| 1887..... | 1.09 | -3.22 | 2.00 | -2.36 | 1.27 | -3.45 | 0.17 | -3.77 | 3.56 | -1.65 | 2.24 | -1.27 |
| 1888..... | 2.75 | -1.56 | 4.66 | 0.30 | 2.73 | -1.99 | 3.76 | -0.18 | 7.74 | 2.53 | 10.42 | 6.31 |
| 1889..... | 8.38 | 4.07 | 2.73 | -1.63 | 4.13 | -0.59 | 3.13 | -0.81 | 2.52 | -3.69 | 6.31 | 2.20 |
| 1890..... | 4.21 | -0.10 | 3.09 | -1.27 | 2.07 | -2.65 | 6.37 | 2.43 | 4.07 | -1.14 | 7.87 | 0.76 |
| Normal. | 4.31 | ..... | 4.36 | ..... | 4.72 | ..... | 3.94 | ..... | 5.21 | ..... | 4.11 | ..... |

TEMPERATURE (in degrees Fahrenheit).

| | | | | | | | | | | | | |
|-----------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|
| 1873..... | 47.3 | -3.4 | 58.0 | 1.6 | 63.6 | 1.2 | 65.7 | -2.8 | 73.7 | -0.7 | 79.1 | -1.1 |
| 1874..... | 55.4 | 4.7 | 55.5 | -0.9 | 65.2 | 2.8 | 63.6 | -4.9 | 74.2 | 0.2 | 80.1 | 0.1 |
| 1875..... | 43.8 | -6.9 | 56.2 | 0.3 | 61.4 | -1.0 | 65.2 | -3.4 | 74.9 | 0.4 | 80.6 | 0.3 |
| 1876..... | 59.6 | 8.9 | 59.1 | 2.6 | 59.6 | -2.9 | 69.1 | 0.6 | 74.4 | 0.0 | 79.8 | -0.5 |
| 1877..... | 48.2 | -2.5 | 55.3 | -1.2 | 62.7 | 0.2 | 67.7 | -0.8 | 73.2 | -1.2 | 78.2 | -2.0 |
| 1878..... | 50.6 | 0.1 | 55.5 | -0.9 | 67.5 | 5.4 | 71.5 | 3.0 | 75.9 | 1.6 | 81.6 | 1.3 |
| 1879..... | 52.5 | 1.8 | 55.0 | -1.4 | 68.4 | 5.9 | 70.3 | 1.9 | 77.4 | 3.0 | 81.4 | 1.1 |
| 1880..... | 63.7 | 13.0 | 56.4 | 0.1 | 60.6 | -1.9 | 71.5 | 3.0 | 75.7 | 1.3 | 79.9 | -0.4 |
| 1881..... | 43.2 | -7.5 | 53.3 | -3.1 | 62.4 | -0.1 | 69.0 | 0.5 | 76.2 | 1.8 | 85.0 | 4.7 |
| 1882..... | 55.8 | 5.1 | 62.0 | 5.5 | 66.4 | 3.9 | 71.2 | 2.7 | 73.4 | -1.0 | 80.3 | 0.1 |
| 1883..... | 47.2 | -3.6 | 52.0 | -4.9 | 62.4 | 0.0 | 69.8 | 1.3 | 73.6 | -0.8 | 80.7 | 0.5 |
| 1884..... | 44.0 | -6.7 | 56.3 | -0.2 | 63.4 | 0.9 | 65.0 | -3.6 | 72.2 | -2.2 | 79.0 | -1.2 |
| 1885..... | 50.1 | 0.0 | 56.2 | -0.2 | 58.0 | -4.5 | 69.3 | 0.8 | 72.0 | -2.4 | 81.2 | 1.0 |
| 1886..... | 43.6 | -4.1 | 54.2 | -2.3 | 58.2 | -1.9 | 66.6 | -1.9 | 76.1 | -1.7 | 81.7 | 1.4 |
| 1887..... | 49.6 | -1.1 | 59.2 | 2.7 | 64.2 | 1.8 | 68.9 | 0.4 | 75.1 | -0.7 | 79.2 | -1.0 |
| 1888..... | 46.5 | -4.2 | 55.6 | -1.0 | 57.3 | -1.2 | 70.9 | 2.4 | 72.6 | -1.6 | 78.4 | -1.8 |
| 1889..... | 51.4 | 0.8 | 55.1 | -1.4 | 59.9 | -2.6 | 69.9 | 1.3 | 73.2 | -1.3 | 77.7 | -2.5 |
| 1890..... | 60.0 | 9.3 | 61.0 | 4.5 | 62.5 | 0.1 | 68.1 | -0.4 | 75.6 | 1.2 | 80.4 | 0.2 |
| Normal. | 50.7 | ..... | 56.5 | ..... | 62.5 | ..... | 68.5 | ..... | 74.4 | ..... | 80.2 | ..... |

*Interpolated.

Mean temperature (degrees Fahr.) observed near Washington, Ark., by Dr. N. D. Smith, Chas. White, and A. H. Carrigan, voluntary observers.

| Year. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---------|----------|-----------|--------|--------|------|-------|-------|---------|------------|----------|-----------|-----------|---------|
| 1840... | 42.1 | 48.7 | 56.8 | 63.2 | 67.9 | 76.1 | 77.5 | 77.3 | 68.0 | 60.9 | 46.7 | 43.0 | 60.7 |
| 1841... | 38.2 | 42.1 | 51.1 | 62.2 | 67.0 | 73.9 | 77.0 | 76.6 | 69.0 | 57.3 | 50.2 | 42.6 | 59.2 |
| 1842... | 46.3 | 46.5 | 51.1 | 62.2 | 67.0 | 74.2 | 73.4 | 71.0 | 57.4 | 43.6 | 41.5 | 41.5 | 60.3 |
| 1843... | 45.7 | 41.8 | 35.3 | 61.4 | 66.9 | 73.5 | 73.5 | 55.4 | 50.0 | 44.0 | 44.0 | 44.0 | 57.9 |
| 1844... | 43.6 | 49.5 | 51.1 | 60.9 | 66.7 | 70.0 | 70.0 | 59.2 | 52.6 | 42.5 | 41.5 | 41.5 | 61.5 |
| 1845... | 46.6 | 51.0 | 52.5 | 61.2 | 66.2 | 73.0 | 73.6 | 56.9 | 48.0 | 35.5 | 35.5 | 35.5 | 61.0 |
| 1846... | 44.0 | 42.2 | 53.8 | 61.2 | 66.1 | 74.7 | 75.8 | 57.8 | 52.1 | 49.2 | 49.2 | 49.2 | 60.9 |
| 1847... | 37.4 | 45.7 | 51.0 | 64.7 | 69.1 | 74.7 | 74.7 | 59.2 | 51.1 | 41.8 | 41.8 | 41.8 | 59.1 |
| 1848... | 49.4 | 51.5 | 51.5 | 63.5 | 68.5 | 78.1 | 77.7 | 62.8 | 46.9 | 43.2 | 43.2 | 43.2 | 61.5 |
| 1849... | 44.3 | 46.5 | 55.7 | 61.2 | 66.4 | 77.0 | 79.5 | 62.5 | 51.7 | 42.3 | 42.3 | 42.3 | 63.5 |
| 1850... | 47.2 | 48.5 | 55.7 | 61.2 | 66.4 | 77.0 | 79.5 | 62.5 | 51.7 | 42.3 | 42.3 | 42.3 | 63.5 |
| 1851... | 46.2 | 48.5 | 55.7 | 61.2 | 66.4 | 77.0 | 79.5 | 62.5 | 51.7 | 42.3 | 42.3 | 42.3 | 63.5 |
| 1852... | 39.0 | 52.0 | 50.0 | 62.0 | 67.0 | 73.0 | 74.0 | 66.8 | 52.0 | 45.0 | 45.0 | 45.0 | 63.4 |
| 1853... | 44.3 | 47.5 | 53.8 | 66.0 | 69.7 | 77.4 | 78.6 | 61.4 | 58.0 | 50.0 | 50.0 | 50.0 | 63.3 |
| 1854... | 46.0 | 49.7 | 51.1 | 61.6 | 71.1 | 77.4 | 81.8 | 66.6 | 52.7 | 47.5 | 47.5 | 47.5 | 64.4 |
| 1855... | 44.0 | 44.0 | 51.7 | 68.3 | 74.7 | 80.0 | 80.8 | 70.9 | 59.4 | 57.1 | 57.1 | 57.1 | 63.3 |
| 1856... | 34.0 | 44.0 | 51.7 | 68.3 | 74.7 | 80.0 | 80.8 | 70.9 | 59.4 | 57.1 | 57.1 | 57.1 | 63.3 |
| 1857... | 36.6 | 37.5 | 55.0 | 68.6 | 76.0 | 79.8 | 78.4 | 73.1 | 61.4 | 48.9 | 48.9 | 48.9 | 63.2 |
| 1858... | 45.8 | 54.4 | 58.0 | 63.8 | 70.1 | 76.0 | 81.8 | 80.5 | 74.1 | 61.3 | 61.3 | 61.3 | 63.8 |
| 1859... | 47.2 | 49.8 | 58.0 | 63.8 | 70.1 | 76.0 | 81.8 | 80.5 | 74.1 | 61.3 | 61.3 | 61.3 | 63.8 |
| 1860... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1861... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1862... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1863... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1864... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1865... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1866... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1867... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1868... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1869... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1870... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1871... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1872... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1873... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1874... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1875... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1876... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1877... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1878... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1879... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1880... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1881... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1882... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1883... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1884... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1885... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1886... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1887... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1888... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1889... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| 1890... | 45.9 | 50.2 | 56.8 | 66.1 | 73.7 | 80.6 | 81.4 | 75.0 | 62.6 | 44.4 | 44.4 | 44.4 | 65.1 |
| Mean... | 43.6 | 48.0 | 54.2 | 63.7 | 70.2 | 76.6 | 80.1 | 78.9 | 72.9 | 61.3 | 51.2 | 44.9 | 62.1 |

Precipitation (inches and hundredths) observed near Forsyth, Ga., by Thomas G. Scott, voluntary observer.

| Year. | January. | February. | March. | April. | May. | June. | July. | August. | September. |
|-------|----------|-----------|--------|--------|------|-------|-------|---------|------------|
|-------|----------|-----------|--------|--------|------|-------|-------|---------|------------|

Table of miscellaneous meteorological data for June, 1890—Signal Service observations.

| Stations and districts. | Elevation above sea-level, feet. | Pressure, in inches. | | | Temperature of air, in degrees Fahrenheit. | | | | | | | Mean temperature of the dew-point. | Mean relative humidity, per cent. | Precipitation, in inches. | Departure from normal precipitation. | Wind. | | | | | Cloudless days. | Partly cloudy days. | Cloudy days. | Days with rainfall. | Average cloudiness, tenths. | | Precipitation data since opening of station. | | | |
|-------------------------|----------------------------------|----------------------|---------------|----------------|--|------------------------|----------|---------------|----------|---------------|-----------------------|------------------------------------|-----------------------------------|---------------------------|--------------------------------------|--------------------|------------------------|-----------------------|-------------------|------------|-----------------|---------------------|--------------|---------------------|-----------------------------|---------------------|--|------------------|-------|-------|
| | | Mean actual. | Mean reduced. | Monthly range. | Monthly mean. | Departure from normal. | Maximum. | Mean maximum. | Minimum. | Mean minimum. | Greatest daily range. | | | | | Least daily range. | Total movement, miles. | Prevailing direction. | Maximum velocity. | | | | | | Length of record, years. | Greatest for month. | Year. | Least for month. | Year. | |
| | | | | | | | | | | | | | | | | | | | Miles per hour. | Direction. | | | | | | | | | | Date. | 8 a. m. | 8 p. m. |
| New England. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eastport..... | 53 | 29.87 | 29.93 | 0.66 | 62.2 | -1.2 | 71 | 60.5 | 44 | 47.4 | 33 | 45-47.8 | 3 | 3.25 | +0.07 | 6,038 | n. | 32 | nw. | 9 | 3 | 12 | 15 | 14.6 | 0.6 | 0.6 | 1874 | 0.66 | 1886 | |
| Portland..... | 99 | 29.84 | 29.94 | 0.58 | 60.6 | -3.4 | 87 | 58.3 | 46 | 52.8 | 31 | 53-58.1 | 4 | 4.33 | +1.13 | 5,969 | nw. | 27 | nw. | 9 | 9 | 11 | 10 | 9.5 | 6.6 | 6.6 | 1879 | 1.41 | 1884 | |
| Manchester..... | 247 | 29.71 | 29.97 | 0.57 | 63.1 | ..... | 87 | 73.6 | 43 | 52.6 | 34 | 50-68.2 | 4 | 3.68 | ..... | 3,683 | nw. | 24 | n. | 2 | 12 | 12 | 6 | 10.5 | 0.4 | 7 | 3.66 | 1890 | 1.73 | 1888 |
| Northfield..... | 872 | 29.04 | 29.90 | 0.51 | 60.6 | ..... | 83 | 71.2 | 36 | 50.1 | 35 | 53-67.4 | 8 | 5.412 | ..... | 5,412 | s. | 36 | n. | 9 | 3 | 19 | 9 | 12.5 | 9.5 | 4 | 3.66 | 1888 | 2.84 | 1890 |
| Boston..... | 125 | 29.85 | 29.98 | 0.59 | 64.2 | -1.8 | 87 | 72.1 | 50 | 56.3 | 35 | 52-62.7 | 2 | 2.60 | -0.37 | 7,759 | nw. | 30 | nw. | 2 | 8 | 13 | 9 | 8.6 | 0.5 | 8 | 7.79 | 1881 | 0.54 | 1873 |
| Nantucket..... | 14 | 29.97 | 29.98 | 0.62 | 60.4 | ..... | 75 | 65.8 | 49 | 54.9 | 17 | 55-63.8 | 3 | 3.49 | ..... | 6,515 | w. | 30 | e. | 22 | 11 | 9 | 11 | 13.5 | 6.4 | 8 | 3.49 | 1890 | 1.51 | 1888 |
| Wood's Holl..... | 22 | 29.97 | 29.99 | 0.58 | 61.2 | ..... | 76 | 66.5 | 50 | 56.0 | 19 | 56-63.8 | 5 | 5.25 | +3.60 | 8,782 | w. | 37 | w. | 9 | 9 | 12 | 9 | 13.5 | 2.5 | 4 | 6.25 | 1881 | 1.01 | 1873 |
| Vineyard Haven..... | 26 | 29.97 | 30.00 | 0.56 | 61.6 | -0.4 | 80 | 67.4 | 50 | 55.8 | 23 | 56-86.8 | 1 | 1.35 | -2.07 | 9,304 | sw. | 37 | ne. | 22 | 13 | 10 | 7 | 8.3 | 5.3 | 9 | 4.35 | 1881 | 0.62 | 1888 |
| Block Island..... | 32 | 29.97 | 30.00 | 0.56 | 61.6 | -0.4 | 80 | 67.4 | 50 | 55.8 | 23 | 56-86.8 | 1 | 1.35 | -2.07 | 9,304 | sw. | 37 | ne. | 22 | 13 | 10 | 7 | 8.3 | 5.3 | 9 | 4.35 | 1881 | 0.62 | 1888 |
| Narragansett Pier..... | 107 | 29.87 | 29.98 | 0.57 | 65.8 | -0.2 | 88 | 74.7 | 48 | 57.1 | 31 | 56-57.5 | 0 | 3.12 | -0.13 | 4,245 | s. | 26 | nw. | 2 | 7 | 14 | 9 | 11.5 | 3.6 | 4 | 6.17 | 1877 | 1.21 | 1880 |
| New Haven..... | 47 | 29.92 | 29.97 | 0.59 | 73.4 | +1.9 | 87 | 72.4 | 51 | 58.2 | 27 | 56-57.5 | 0 | 3.12 | -0.13 | 4,245 | sw. | 24 | nw. | 2 | 7 | 13 | 10 | 10.5 | 9.6 | 4 | 7.70 | 1877 | 0.58 | 1873 |
| Mid. Atlantic States. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Albany..... | 85 | 29.88 | 29.97 | 0.53 | 68.5 | -0.5 | 89 | 76.9 | 46 | 58.1 | 32 | 57-70.7 | 2 | 2.72 | -1.03 | 5,488 | s. | 28 | n. | 5 | 7 | 17 | 6 | 13.4 | 8.5 | 9 | 6.43 | 1889 | 1.80 | 1884 |
| New York City..... | 185 | 29.80 | 30.00 | 0.54 | 70.4 | +1.4 | 89 | 78.7 | 35 | 62.1 | 36 | 57-70.7 | 2 | 2.72 | -1.03 | 5,488 | s. | 28 | n. | 5 | 7 | 17 | 6 | 13.4 | 8.5 | 9 | 6.43 | 1889 | 1.80 | 1884 |
| Harrisburg..... | 377 | 29.61 | 30.00 | 0.54 | 73.4 | ..... | 92 | 82.1 | 51 | 62.6 | 32 | 59-68.5 | 4 | 4.19 | ..... | 3,918 | w. | 39 | n. | 12 | 10 | 13 | 6 | 9.4 | 6.6 | 6 | 7.18 | 1889 | 2.97 | 1889 |
| Philadelphia..... | 117 | 29.89 | 30.01 | 0.57 | 73.6 | +1.6 | 92 | 83.0 | 35 | 64.2 | 25 | 58-64.2 | 1 | 1.30 | -0.93 | 6,551 | nw. | 34 | nw. | 7 | 9 | 10 | 11 | 6.5 | 2.5 | 5 | 6.81 | 1887 | 0.74 | 1885 |
| Atlantic City..... | 53 | 29.96 | 30.01 | 0.56 | 68.9 | +1.9 | 90 | 75.0 | 54 | 62.8 | 27 | 61-69.1 | 2 | 2.02 | -0.29 | 6,485 | s. | 33 | nw. | 6 | 11 | 17 | 2 | 9.3 | 7.4 | 2 | 5.20 | 1879 | 1.33 | 1885 |
| Baltimore..... | 76 | 29.92 | 30.00 | 0.62 | 75.0 | +2.0 | 93 | 84.0 | 55 | 65.9 | 28 | 61-69.1 | 2 | 2.02 | -0.29 | 6,485 | s. | 33 | nw. | 6 | 11 | 17 | 2 | 9.3 | 7.4 | 2 | 5.20 | 1879 | 1.33 | 1885 |
| Washington City..... | 112 | 29.89 | 30.01 | 0.61 | 74.8 | +1.8 | 93 | 84.0 | 55 | 65.9 | 28 | 61-69.1 | 2 | 2.02 | -0.29 | 6,485 | s. | 33 | nw. | 6 | 11 | 17 | 2 | 9.3 | 7.4 | 2 | 5.20 | 1879 | 1.33 | 1885 |
| Cape Henry..... | 685 | 29.31 | 30.03 | 0.60 | 75.9 | +3.9 | 96 | 83.9 | 56 | 67.9 | 30 | 63-67.4 | 1 | 1.63 | -2.05 | 2,702 | nw. | 22 | w. | 15 | 3 | 21 | 6 | 15.6 | 2.6 | 5 | 6.89 | 1889 | 2.20 | 1885 |
| Lynchburg..... | 43 | 29.98 | 30.02 | 0.57 | 77.0 | +2.0 | 95 | 85.9 | 58 | 68.1 | 24 | 65-67.3 | 1 | 2.29 | -1.53 | 5,321 | s. | 33 | nw. | 7 | 14 | 11 | 5 | 7.4 | 0.5 | 6 | 6.52 | 1883 | 1.38 | 1875 |
| S. Atlantic States. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Charlotte..... | 806 | 29.22 | 30.06 | 0.51 | 80.2 | +4.2 | 98 | 91.5 | 64 | 69.0 | 26 | 65-65.2 | 0 | 0.52 | -4.07 | 3,295 | w. | 23 | ne. | 29 | 23 | 7 | 0 | 6.3 | 6.4 | 9 | 11.04 | 1886 | 0.52 | 1890 |
| Hatteras..... | 11 | 29.63 | 30.03 | 0.56 | 78.6 | +3.4 | 92 | 85.6 | 55 | 68.0 | 26 | 65-65.2 | 0 | 0.52 | -4.07 | 3,295 | w. | 23 | ne. | 29 | 23 | 7 | 0 | 6.3 | 6.4 | 9 | 11.04 | 1886 | 0.52 | 1890 |
| Raleigh..... | 388 | 29.63 | 30.03 | 0.56 | 78.6 | +3.4 | 92 | 85.6 | 55 | 68.0 | 26 | 65-65.2 | 0 | 0.52 | -4.07 | 3,295 | w. | 23 | ne. | 29 | 23 | 7 | 0 | 6.3 | 6.4 | 9 | 11.04 | 1886 | 0.52 | 1890 |
| Southport..... | 53 | 29.99 | 30.03 | 0.54 | 80.1 | +3.1 | 100 | 89.2 | 63 | 71.0 | 26 | 70-87.9 | 3 | 3.26 | -2.96 | 4,314 | sw. | 24 | w. | 24 | 4 | 20 | 6 | 12.4 | 9.5 | 5 | 9.74 | 1887 | 2.87 | 1881 |
| Charleston..... | 52 | 30.01 | 30.06 | 0.47 | 82.2 | +3.2 | 98 | 89.7 | 69 | 74.8 | 23 | 74-83.2 | 1 | 3.32 | -4.14 | 4,188 | sw. | 27 | sw. | 24 | 1 | 10 | 19 | 9.3 | 3.7 | 6 | 14.98 | 1876 | 1.32 | 1890 |
| Columbia..... | 183 | 29.88 | 30.07 | 0.48 | 81.4 | +2.2 | 102 | 91.8 | 65 | 71.0 | 27 | 71-75.8 | 1 | 1.80 | -3.96 | 4,601 | sw. | 35 | ne. | 30 | 10 | 15 | 2 | 14.1 | 8.8 | 19 | 9.66 | 1887 | 1.25 | 1879 |
| Augusta..... | 87 | 29.98 | 30.06 | 0.47 | 80.9 | +0.9 | 98 | 90.3 | 65 | 71.5 | 25 | 71-75.8 | 1 | 1.80 | -3.96 | 4,601 | sw. | 35 | ne. | 30 | 10 | 15 | 2 | 14.1 | 8.8 | 19 | 9.66 | 1887 | 1.25 | 1879 |
| Savannah..... | 43 | 29.98 | 30.06 | 0.47 | 80.9 | +0.9 | 98 | 90.3 | 65 | 71.5 | 25 | 71-75.8 | 1 | 1.80 | -3.96 | 4,601 | sw. | 35 | ne. | 30 | 10 | 15 | 2 | 14.1 | 8.8 | 19 | 9.66 | 1887 | 1.25 | 1879 |
| Jacksonville..... | 28 | 30.07 | 30.10 | 0.29 | 80.4 | ..... | 95 | 87.0 | 71 | 73.7 | 20 | 73-88.0 | 2 | 2.51 | ..... | 4,419 | se. | 24 | ne. | 2 | 10 | 18 | 2 | 5.3 | 6.3 | 7 | 9.80 | 1889 | 2.51 | 1890 |
| Florida Peninsula. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jupiter..... | 28 | 30.07 | 30.10 | 0.29 | 80.4 | ..... | 95 | 87.0 | 71 | 73.7 | 20 | 73-88.0 | 2 | 2.51 | ..... | 4,419 | se. | 24 | ne. | 2 | 10 | 18 | 2 | 5.3 | 6.3 | 7 | 9.80 | 1889 | 2.51 | 1890 |
| Key West..... | 22 | 30.08 | 30.10 | 0.28 | 81.4 | -1.6 | 90 | 85.7 | 70 | 77.0 | 14 | 72-97.4 | 8 | 3.33 | -0.70 | 5,405 | e. | 24 | s. | 2 | 11 | 16 | 3 | 11.5 | 4.3 | 8 | 8.22 | 1887 | 0.88 | 1888 |
| Mico..... | 36 | 30.07 | 30.11 | 0.30 | 80.8 | ..... | 94 | 89.4 | 65 | 72.1 | 27 | 72-83.2 | 1 | 1.30 | -0.93 | 6,551 | nw. | 34 | nw. | 7 | 9 | 10 | 11 | 6.5 | 2.5 | 5 | 6.81 | 1887 | 0.74 | 1885 |
| Tampa..... | 44 | 30.06 | 30.10 | 0.35 | 80.8 | ..... | 94 | 89.4 | 65 | 72.1 | 27 | 72-83.2 | 1 | 1.30 | -0.93 | 6,551 | nw. | 34 | nw. | 7 | 9 | 10 | 11 | 6.5 | 2.5 | 5 | 6.81 | 1887 | 0.74 | 1885 |
| Titusville..... | 44 | 30.06 | 30.10 | 0.35 | 80.8 | ..... | 94 | 89.4 | 65 | 72.1 | 27 | 72-83.2 | 1 | 1.30 | -0.93 | 6,551 | nw. | 34 | nw. | 7 | 9 | 10 | 11 | 6.5 | 2.5 | 5 | 6.81 | 1887 | 0.74 | 1885 |
| Eastern Gulf States. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Atlanta..... | 1,139 | 28.90 | 30.07 | 0.41 | 78.8 | +2.8 | 98 | 88.9 | 62 | 68.6 | 26 | 65-66.9 | 1 | 1.12 | -3.53 | 4,897 | nw. | 25 | e. | 1 | 11 | 18 | 1 | 8.3 | 7.5 | 9 | 10.73 | 1884 | 1.12 | 1890 |
| Pensacola..... | 50 | 30.00 | 30.06 | 0.32 | 79.6 | -0.4 | 95 | 85.2 | 70 | 74.0 | 17 | 72-80.0 | 2 | 2.21 | -4.61 | 6,104 | sw. | 31 | sw. | 23 | 5 | 21 | 4 | 10.3 | 3.4 | 5 | 11.41 | 1887 | 2.21 | 1890 |
| Auburn..... | 35 | 30.04 | 30.08 | 0.31 | 80.0 | ..... | 97 | 87.9 | 67 | 72.0 | 24 | 72-80.0 | 2 | 2.21 | -4.61 | 6,104 | sw. | 31 | sw. | 23 | 5 | 21 | 4 | 10.3 | 3.4 | 5 | 11.41 | 1887 | 2.21 | 1890 |
| Mobile..... | 217 | 29.83 | 30.06 | 0.38 | 81.1 | +1.1 | 98 | 87.9 | 67 | 72.0 | 24 | 72-80.0 | 2 | 2.21 | -4.61 | 6,104 | sw. | 31 | sw. | 23 | 5 | 21 | 4 | 10.3 | 3.4 | 5 | 11.41 | 1887 | 2.21 | 1890 |
| Montgomery..... | 358 | 29.69 | 30.06 | 0.30 | 79.4 | ..... | 96 | 89.7 | 69 | 74.8 | 23 | 74-83.2 | 1 | 3.32 | -4.14 | 4,188 | sw. | 27 | sw. | 24 | 1 | 10 | 19 | 9.3 | 3.7 | 6 | 14.98 | 1876 | 1.32 | 1890 |
| Meridian..... | 223 | 29.81 | 30.04 | 0.29 | 79.9 | -0.1 | 94 | 88.7 | 66 | 71.5 | 24 | 71-75.8 | 1 | 1.80 | -3.96 | 4,601 | sw. | 35 | ne. | 30 | 10 | 15 | 2 | 14.1 | 8.8 | 19 | 9.66 | 1887 | 1.25 | 1879 |
| Vicksburg..... | 223 | 29.81 | 30.04 | 0.29 | 79.9 | -0.1 | 94 | 88.7 | 66 | 71.5 | 24 | 71-75.8 | 1 | 1.80 | -3.96 | 4,601 | sw. | 35 | ne. | 30 | 10 | 15 | 2 | 14.1 | 8.8 | 19 | 9.66 | 1887 | 1.25 | 1879 |
| University..... | 52 | 30.00 | 30.06 | 0.31 | 80.6 | -0.4 | 94 | 88.0 | 69 | 70.3 | 21 | 71-87.9 | 6 | 4.44 | ..... | 4,884 | w. | 25 | nw. | 19 | 8 | 14 | 8 | 14.3 | 2.5 | 3 | 12.05 | 1889 | 2.71 | 1882 |
| New Orleans..... | 52 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table of miscellaneous meteorological data for June, 1890.—Signal Service observations.—Continued.

[illegible]

* Two or more directions, dates, or years. † Precipitation is measured at the Boston Water Works. ‡ Received too late to be considered in departures, etc. ‡ Not received.



NOTES.

The Roman letters show number and order of areas of low pressure. The figures above the lines show the days of the month, those below (1 and 2) indicate, respectively, the 8 a. m. and 6 p. m., 75th meridian time, observations.

The dotted shading () indicates fog belts.

The ruled shading () indicates the position in which field-ice or icebergs were observed.

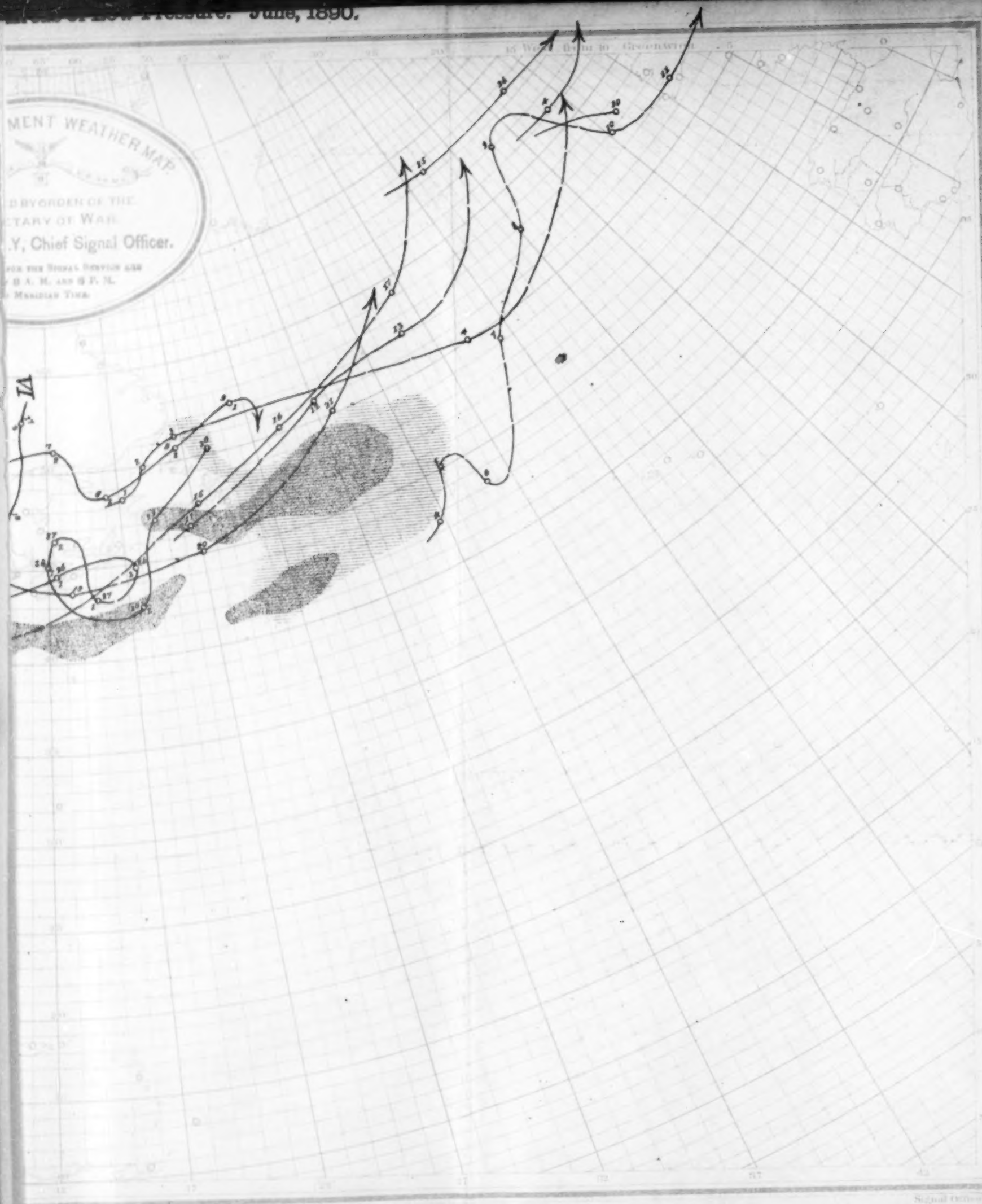
Low Pressure. June, 1890.

MENT WEATHER MAP

BY ORDER OF THE
SECRETARY OF WAR
J. Y. Chief Signal Officer.

FOR THE SIGNAL SERVICE AND
U. S. A. N. AND U. S. N.
IN METRIC TIME

IA





1000



List of voluntary observers of the Signal Service, who furnish meteorological reports for the Monthly Weather Review.

The figures refer to missing reports, thus: 1 indicates that report for January has not been received; 235 that reports for February, March, and May have not been received.

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|---|---|---|--|--|
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| Dr S W Abbott Wakefield Mass | Mrs H A Hepburn Evart Mich | L Morill Parkville Mich | J M Cox Batesville Miss | Sgt A L McRae Columbia Mo |
| Boston Mfg Co Waltham Mass | L D Watkins 1 Fairview Mich | H M Warren Pontiac Mich | A G Smith Booneville Miss | Rev Fr Paul Conception Mo |
| Prof Sarah F Whiting Wellesley Mass | M Conklin Fitchburgh Mich | J W Hutchins Pulaski Mich | W B Hopkins 5 Columbus Miss | Dr J G Reaser Carthage Mo |
| G S Newcomb Westborough Mass | C I Rathbun Fremont Mich | J C Gould Paw Paw Mich | Miss H Quinche 126 Columbus Miss | H M Wollard 1234 Dunnegan Mo |
| L R Symmes Winchester Mass | W L Fisher Flint Mich | L R Brown Rawsonville Mich | G W Smith-Vaniz Canton Miss | S Newton 1234 Eldon Mo |
| R Fobes 16 Worcester Mass | J W Morris Grape Mich | H M Heal Roscommon Mich | C W Barber Edwards Miss | A Reinisch Excelsior Springs Mo |
| Michigan. | F W Ball Grand Rapids Mich | Prof O D Thompson Romeo Mich | I N Bedford Fayette Miss | Prof T Berry Smith Fayette Mo |
| G W Grigsby Allegan Mich | O Palmer Grayling Mich | O A Hunt St John's Mich | E R Somerville 2 Greenville Miss | W W Vermillion 45 Frankford Mo |
| P M Smith Alma Mich | J H Scott Gaylord Mich | W E Nims Sand Beach Mich | J H Cleveland 123 Hattiesburgh Miss | Prof C W Pritchett Glasgow Mo |
| W H Howard Adrian Mich | Prof F C Smith Gladwin Mich | Rev J Ferris St Ignace Mich | Dr F B Shuford Holly Springs Miss | Miss Maud Rippey 1234 Glenwood Mo |
| H Obenhoff Atlantic Mine Mich | A Beebe Gulliver Mich | C H Force Stockbridge Mich | H T Bryant 3 Holly Springs Miss | E K Graham Grand Pass Mo |
| | | R C Gardner Stanton Mich | S Flanigan 34 Jackson Miss | C L Hixson 35 Hannibal Mo |

A J Sharp
Harrisonville Mo
Chas Maushund
6 Hermann Mo
W H Delano
Ironton Mo
S J Spurgeon
Kansas City Mo
F D Chubbuck
345 Kidder Mo
Prof J K Hull
1234 Lamar Mo
J S Slaven
23 Lamonte Mo
H T Wright
Lebanon Mo
J R Eaton
Liberty Mo
F King
124 Marshallfield Mo
Mrs M E Sydenstricker
34 New Frankford Mo
Max Eimbeck
New Haven Mo
Henry Bruhl
Oak Ridge Mo
Wm Kaucher
Oregon Mo
B C Y Brown
56 Ozark Mo
M B W Harman
12346 Pickering Mo
W A McDowell
1234 Platt River Mo
Silas C Turnbo
Protem Mo
C C Owen
12345 Proteum Mo
Wm Hiron
Princeton Mo
C B Armstrong
123 Sarcosie Mo
Dr J R Mudd
St Charles Mo
L C Saeger
156 St Charles Mo
Post Surgeon
Jefferson Barracks
Saint Louis Mo
Prof F E Nipher
Washington University
Saint Louis Mo
C G Taylor
Sedalia Mo
J S Chandler
Shelbina Mo
E A Pinnell
56 Steelville Mo
S W Gilbert
1246 Thayer Mo
Prof G L Osborne
5 Warrensburg Mo
Prof J H Frick
Warrenton Mo
Capt Wm Hughes
Willow Springs Mo
G W Goodlett
1234 Windsor Mo
J R Dudley
Wither's Mill Mo
Montana.
R W Rock
(Henry's Lake, Idaho)
Allerdice, Mont
S M Corson
1234 Choteau Mont
Post Surgeon
Fort Assiniboine Mont
Post Surgeon
Fort Custer Mont
Post Surgeon
Fort Keogh Mont
Post Surgeon
Fort Maginnis Mont
Post Surgeon
Fort Missoula Mont

Post Surgeon
(Camp Poplar River)
Poplar Creek Agency Mont
Post Surgeon
Fort Shaw Mont
J H Ray
Glendive Mont
Wm Gaddis
Fort Logan Mont
R C Clendenin
Martinsdale Mont
Dr J E Jenkins
(Blackfeet Agency)
12 Pigeon Mont
J M Graham
Powderville Mont
Sarah E Sheldon
Sheldon Mont
Eugene Stark
Virginia City Mont
C E Woodworth
12345 Woodworth Mont
Nebraska.
Dr W R Lewis
123 Alliance Nebr
G Shedd
3 Ashland Nebr
Peter Fowlie
Ansley Nebr
W C Wood
5 Bingham Nebr
G Roberts
Creighton Nebr
Prof G D Swezey
Crete Nebr
Sgt G A Loveland
Crete Nebr
Mrs L A Wibley
Culbertson Nebr
Chas Seltz
De Soto Nebr
E B Taylor
David City Nebr
Dr I Humphrey
Fairbury Nebr
Post Surgeon
Fort Niobrara Nebr
Post Surgeon
Fort Omaha Nebr
Post Surgeon
Fort Robinson Nebr
Post Surgeon
Fort Sidney Nebr
Isaac E Heaton
Fremont Nebr
W A Harshbarger
Franklin Nebr
G W Talbot
Grant Nebr
J B Moore
Grand Island Nebr
G S Truman
Genoa Nebr
John P Finley
1 Gering Nebr
Wm Waterman
Hay Springs Nebr
Dr C M Easton
Hebron Nebr
M E Randolph
12345 Holdrege Nebr
G D Carrington
Howe Nebr
J M Bird
12345 Imperial Nebr
Mrs M G Erickson
Kennedy Nebr
D Henderson Jr
Kimball Nebr
University of Nebraska
Lincoln Nebr
J M Tipton
Lexington Nebr
R W Blake
1234 Long Pine Nebr
John Ellis (Marquette)
Central City Nebr

J Hull
4 Minden Nebr
L S Trefun
45 Mullen Nebr
E W Black
North Loup Nebr
J B Parmalee
Nebraska City Nebr
G S Clingman
Oakdale Nebr
A N Morris
12345 O'Neill Nebr
E H Talbot
12345 Ough Nebr
C Shieldstream
Palmer Nebr
R P Harris
1234 Paxton Nebr
E Smith
Ravenna Nebr
P W Risser
Syracuse Nebr
J S Spooner
15 Sargent Nebr
W L Dunlap
Tecumseh Nebr
Dr A D Nesbit
12 Tekamah Nebr
C C Wright
12345 Thedford Nebr
J L Truman
5 West Hill Nebr
G Treat
Weeping Water Nebr
E G Bruner
West Point Nebr
J R Campbell
Weston Nebr
Mrs C W Le Bar
123 Wilcox Nebr
Nevada.
O B Vincent
Austin Nev
Agent C P R R
3 Beowawe Nev
G Nicholl
4 Belmont Nev
Prof C W Friend
Carson City Nev
Sgt H E Wilkinson
Carson City Nev
W T Crane (Cranes' Ranch)
Elko Nev
W H Shockley
Candelaria Nev
D Fowler
Downeyville Nev
J F Cupid
Ely Nev
C H Sproule
Elko Nev
M M Ley
Eureka Nev
P W Davis
El Dorado Canyon Nev
G W Dungan
Genoa Nev
H H Robinson
3 Gold Mountain Nev
Miss Mary Estabrook
(Hot Springs)
White Plains Nev
Agent C P R R
Humboldt Nev
N P Dooley
Pioche Nev
Agent C P R R
Palisade Nev
Wm Oothout
16 Palmetto Nev
W S Devoe (Agl Ex Sta'n)
6 Reno Nev
W B Lawler
Ruby Hill Nev
T T Keay
6 Sodaville Nev

Prof M D Bowen
34 Tuscarora Nev
C R Carter
56 Verdi Nev
Mark Averill
6 Virginia City Nev
H White (Younts Ranch
46 Nev) via Daggett Cal
New Hampshire.
F W Palmer
Antrim N H
O F Cole
Berlin Falls N H
Q A Bridges
Berlin Mills N H
W L Foster
Concord N H
N A Briggs
East Canterbury N H
Ag'l Experiment Station
Hanover N H
Dartmouth College Obs'y
Hanover N H
Lake Winipiseogee
Cotton and Woollen M'fg Co
Lake Village N H
W Little
Manchester N H
Jackson Co
Nashua N H
C H Webster
Nashua N H
C E Hosmer
North Sutton N H
W C Gale
Newton N H
J L Binford
North Conway N H
Miss Helen M Clark
Plymouth N H
N B Waters
Stratford N H
E A Knowlton
Walpole N H
A A Higgins
West Milan N H
New Jersey.
R Ross
Asbury N J
H Allaire
1 Allaire N J
Prof C F Richardson
Beverly N J
J H Preston
Billingsport
Paulsborough N J
H A Jordan
Bridgeton N J
Rev W J Leggett
Belleville N J
Dr J F Leaming
Cape May C H N J
H Y Postma
Egg Harbor City N J
Miss A S Yard
Freehold N J
R N Cornish
Gillette N J
M M Cook
46 Hanover N J
J M Dalrymple
45 Hopewell N J
Dr F C Price
Imlaystown N J
Geo. Fleming
Junction N J
Dr G H Larison
1 Lambertville N J
G W Hockenbury
Locktown N J
J H Eadie
Madison N J
T J Beans
Moorestown N J
C V Meyers
New Brunswick N J

Prof A Scott
New Brunswick N J
Sgt E W McGann
New Brunswick N J
F W Ricord
Newark N J
C V Meyers
Newton N J
W Lake
Ocean City N J
Rev S W Knipe
Oceanic N J
T Reed
Princeton N J
J Fleming
Readington N J
S Haines
Rancocas N J
Dr W J Chandler
South Orange N J
A D Atwood
Tenafly N J
E R Cook
Trenton N J
F S Dunbar
Union N J
W T Wilson
Woodbury N J
New Mexico.
S M Rowe
Albuquerque N Mex
E A Sutherland
Chama N Mex
J M Fish
Coolidge N Mex
Post Surgeon
Fort Bayard N Mex
Post Surgeon Fort Marcy
Santa Fe N Mex
Post Surgeon
Fort Selden N Mex
Post Surgeon
Fort Stanton N Mex
Post Surgeon
Fort Union N Mex
Post Surgeon
Fort Wingate N Mex
J E Whitmore
Gallinas Spring N Mex
J E Smith
Hillsborough N Mex
F W Chatfield
346 Las Vegas N Mex
Richard Pohl
Los Lunas N Mex
Jose M Vega
5 Nogal N Mex
R H Hills (Red Canon)
5 Carthage N Mex
M A Upson
Roswell N Mex
A Knell
1234 Tequesquite N Mex
New York.
F S Place
Alfred Centre N Y
J P Slocum
Angelica N Y
Richard B Arden (Ardenia)
Garrison's N Y
Dr F A Winne
1 Brockport N Y
Prof W C Peckham
406 Clason ave
256 Brooklyn N Y
Post Surgeon Fort Porter
Buffalo N Y
D B Stillman
6 Brookfield N Y
Prof H Priest
Canton N Y
Thomas Manning
Carmel N Y
R Sanford Miller
Constableville N Y
G Pomeroy Keese
Cooperstown N Y

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| Post Surgeon Davids Island N Y | Wm Weaver 4 Quaker Street N Y | H L Kimrey Soapstone Mount N C | Prof A C Redding Findlay Ohio | Prof A B Willmott Yellow Springs Ohio |
| Gerity Brothers Elmira N Y | DeWitt E Jenkins Queensbury N Y | T A Clark Weldon N C | G M Fink Fostoria Ohio | A G Frost Youngstown Ohio |
| Dr J Finley Bell 1234 East Hampton N Y | Dr H C Sutton Rome N Y | Dr J M Gallagher Washington N C | S M Luther Garrettsville Ohio | Oregon. |
| W P Hunt Eden N Y | Post Surgeon Ft Wadsworth Rosebank Staten Island N Y | H Clay Williams Willeyton N C | C G Katzenberger Greenville Ohio | John Briggs Albany Oregon |
| T P Yates Factoryville N Y | Post Surgeon Madison Barracks Sackett's Harbor N Y | North Dakota. | Dr T W Gordon Georgetown Ohio | E H Andrews 1235 Alpine Oregon |
| Robert Warwick Fleming N Y | Selah B Strong Setauket N Y | J W Leech Davenport N Dak | M N Smith 1346 Granville Ohio | F L Carter Ashland Oregon |
| Mrs N S Yates Geneva N Y | James E Wilson South Canisteo N Y | Post Surgeon Fort A Lincoln N Dak | W B Longstreth Gratiot Ohio | Geo Bennett Bandon Oregon |
| Post Surgeon Fort Hamilton N Y | D C Sharpe South Kortright N Y | Post Surgeon Fort Buford N Dak | D G Lewis Hassan Ohio | T L Arnold Beulah Oregon |
| C H Spaulding Hess Road Station N Y | E Ripley Sherman N Y | Post Surgeon Fort Pembina N Dak | James Bull Hanging Rock Ohio | W R Gradon 12 Burns Oregon |
| James Hyatt (Honeymead-brook) Stanfordville N Y | R T Church Turin N Y | Post Surgeon Fort Totten N Dak | Prof G H Colton Hiram Ohio | State Agr'l College Corvallis Oregon |
| Chas E Whitney Humphrey N Y | Thomas Birt Utica N Y | Post Surgeon Fort Yates N Dak | Prof N B Hobart Hudson Ohio | U S Engineer Officer Cascade Locks Oregon |
| G A Trowbridge Ilion N Y | Post Surgeon Willetts Point Whitestone N Y | S J Pound Gallatin N Dak | Dr J B Owsley Jacksonborough Ohio | M C Close 56 Creswell Oregon |
| Engineering Dept Cornell University Ithaca N Y | Post Surgeon Military Academy West Point N Y | G S Sprague (University) 123 Grand Forks N Dak | J L Hervey Jefferson Ohio | E P Balch 1256 Dufur Oregon |
| Prof E A Fierres Ithaca N Y | Post Surgeon Fort Schuyler West Chester N Y | L C Stanford 12345 Kelso N Dak | L J Demarest Kenton Ohio | F S Moore Ellensburg Oregon |
| Observer Signal Service Ithaca N Y | Post Surgeon Watervliet Arsenal West Troy N Y | Julius H Hoof 6 Napoleon N Dak | P W Eigner 6 Kent Ohio | Thos Pearce Eola Oregon |
| Henry A Stone (Kingston) 5 Rondout N Y | O F Corwin Wedgwood N Y | L M P Griswold New England City N Dak | J D Hadermann Leipsic Ohio | Dr G Wigg East Portland Oregon |
| R N Hunt Kendall N Y | Prof O R Willis White Plains N Y | F R Hill Steele N Dak | W S Dean Lordstown Ohio | Prof G W Shaw Forest Grove Oregon |
| J H Bailey 2 Keene Valley N Y | Post Surgeon Fort Niagara Youngstown N Y | C A McKene Wahpeton N Dak | Prof T D Briscoe Marietta Ohio | J S Gray Gardiner Oregon |
| W Hudson Stephens 6 Lowville N Y | North Carolina. | Peter Ross 12345 Wild Rice N Dak | E H Raffensberger 12345 Marion Ohio | Wm Holden 36 Grass Valley Oregon |
| Dr M A Veeder P O Box 602 Lyons N Y | Dr Karl von Ruck Asheville N C | Ohio. | C H Morris 5 McConnellsville Ohio | Dr J G Jessup Grant's Pass Oregon |
| M H Kinsey 1246 Massena N Y | H C Dunn Clear Creek N C | Dr P H Clark Ashland Ohio | Dr T C Hunter Napoleon Ohio | J H Neal (Happy Valley) |
| F X Straub Middleburgh N Y | Prof J W Gore Chapel Hill N C | Prof A D Morrell Athens Ohio | Dr A M Beers New Comerstown Ohio | 12345 Diamond, Oregon |
| R S Holmes (Marshland) Apalachin N Y | T B Lindsley Douglas N C | Prof H V Egbert Akron Ohio | Jos A Hook New Alexandria Ohio | A Smith Heppner Oregon |
| C W York 126 Malone N Y | H R Horne 12345 Fayetteville N C | P W Barton Bement Ohio | H D Gowey North Lewisburgh Ohio | W H Goudy 45 Hubbard Oregon |
| S Talcott 12 Middletown N Y | L Crawford Franklin N C | W E Sheffield Bellevue Ohio | E U Hyde Orangeville Ohio | Dr E J Thomas Hood River Oregon |
| Director Met'l Observatory Central Park New York City | Dr W B Berry Hot Springs N C | S M Painter Bangorville Ohio | Prof F F Jewett Oberlin Ohio | P Britt Jacksonville Oregon |
| Post Surgeon Fort Columbus New York City | Dr R L Beall Lenoir N C | J E Hopley 12 Bucyrus Ohio | J C Light 6 Ottawa Ohio | J R Blackaby Jordan Valley Oregon |
| G A Yates New Lisbon N Y | Henry Tiffany 12345 Marion N C | E T M Williams Clarksville Ohio | C Stewart 46 Poland Ohio | W A Leslie Joseph Oregon |
| C A Wooster North Hammond N Y | Dr P L Murphy (Insane Asy) 13 Morganton N C | Post Surgeon Columbus Barracks Columbus Ohio | Dr D B Cotton Portsmouth Ohio | S C Beach 12345 Lake View Oregon |
| Chas Fenton Number Four N Y | Prof H L T Ludwig Mt Pleasant N C | Prof B F Thomas Columbus Ohio | Dr D N Allard Pomeroy Ohio | W H Colwell Lone Rock Oregon |
| N Nelson 5 Ogdensburg N Y | J W Ashby Mt Airy N C | Lieut C E Kilbourne Columbus Ohio | J W Manning 56 Salineville Ohio | J K Romig La Grande Oregon |
| J P Davis 25 Oxford N Y | W G Boyd 56 New Berne N C | Cpl C M Strong Columbus Ohio | Miss Ruth Ellis Springborough Ohio | Rev Fr B Held Mount Angel Oregon |
| G H Hudson Plattsburgh N Y | Prof G S Willis 6 Oak Ridge N C | G A Hyde 85 Kennard at Cleveland Ohio | Peter Bowman Shiloh Ohio | Capt W Harris McMinnville Oregon |
| E B Bartlett (Palermo) Vermillion N Y | Prof A McIver Pittsborough N C | Prof W F McDaniel Celina Ohio | Prof T H Sonedecker Tiffin Ohio | G Venable North Powder Oregon |
| L D Cummings Palmyra N Y | T C Harris Raleigh N C | H Renick Circleville Ohio | Dr A Billhardt Upper Sandusky Ohio | Hon H E Hayes Oswego Oregon |
| Wm D Lovell Pendleton Centre N Y | Dr Herbert B Battle Raleigh N C | C F Stokey Canton Ohio | M D McCorkle Vienna Ohio | Sgt B S Pague Portland Oregon |
| W H Jeffers (near Perry City) Trumansburgh N Y | Sgt C F von Herrmann Raleigh N C | Peter M Herold Carrollton Ohio | Prof C W Williamson Wapakoneta Ohio | P Zahnes Pendleton Oregon |
| Post Surgeon Plattsburgh Barracks N Y | J A Hedrick Salisbury N C | W H Baker Ohio State University Columbus Ohio | Dr O N Stoddard Wooster Ohio | W F Abshier (Silver Lake) |
| Peter Vilas Potsdam N Y | R J Noble 12345 Smithfield N C | B B Ault Demos Ohio | Thomas Mikesell Wauseon Ohio | 5 Prineville Oregon |
| Vassar College Obs'y 1 Poughkeepsie N Y | | Mrs Edith E L Boyer Dayton Ohio | Prof J Haywood Westerville Ohio | J McDonald 56 Saint Helen Oregon |
| J N Tilden Peekskill N Y | | C W Goodspeed Elyria Ohio | Dr F Young Weymouth Ohio | W C Cusick 356 Telocaset Oregon |
| | | A C Beardsley 234 Ellsworth Ohio | D Lorbach Waverly Ohio | S L Brooks 45 The Dalles Oregon |
| | | | L S Motte West Milton Ohio | A P Wilson 56 Tillamook Oregon |
| | | | | Dr H W Vincent 5 Toledo Oregon |
| | | | | G W Dalles Vernonia Oregon |

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| M A Baker 6 Weston Oregon | E E Weller Lancaster Pa | W C Kimber Waynesburgh Pa | Post Surgeon Fort Meade S Dak | C Hawkins McKenzie Tenn |
| Pennsylvania. | Culbertson & Lantz 2 3 Lewistown Pa | Mrs L H Grenewald York Pa | Post Surgeon Fort Randall Armour S Dak | J A McKenzie 12 Maryville Tenn |
| Dr C B Dudley Altoona Pa | D M Shelley (Aqueduct) Logania Pa | Rhode Island. | Post Surgeon Fort Sully S Dak | Dr J D Plunket Nashville Tenn |
| Prof G W Bowman Annville Pa | Prof J A Robb Lock Haven Pa | N G Herreshoff Bristol R I | G A Perly Flandreau S Dak | Sgt H C Bate Nashville Tenn |
| J Grathwohl Blooming Grove Pa | Geo W T Warburton Le Roy Pa | N Helme Kingston R I | W W Butler 12 Highmore S Dak | W C Thompson Nunnely Tenn |
| Lerch & Rice 5 Bethlehem Pa | J & B H Metcalf 12 Meadville, Pa | C O Flagg Kingston R I | Sgt S W Glenn Huron S Dak | J C Williamson Parksville Tenn |
| A H Boyle Blue Knob Pa | J J Boyd Mauch Chunk Pa | G W Pratt Lonsdale R I | A S Stuver Kimball S Dak | Dr W F G Wilson 6 Rugby Tenn |
| M H Boye Coopersburgh Pa | Thos F Sloan McConnellsburgh Pa | Post Surgeon Fort Adams Newport R I | D W Diggs 12 Milbank S Dak | Miss C M Nugent Rogersville Tenn |
| J E Pague Carlisle Pa | W H Kline Myerstown Pa | Thos Dunn 5 Newport R I | O B Chesley 126 Oelrichs S Dak | F K Ferguson Riddleton Tenn |
| Miss Mary A Ricker 36 Chambersburgh Pa | F Mortimer 56 New Bloomfield Pa | C H Cannon Olneyville R I | Mrs M F Goddard Onida S Dak | H R Hinkle 2 Savannah Tenn |
| Prof C M Thomas 6 Clarion Pa | W T Butz New Castle Pa | J H Walker Pawtucket R I | John J Swartz Parkston S Dak | W J Breeding Spring Dale Tenn |
| R M Graham 3 Catawissa Pa | J S Gibson Nisbet Pa | Office City Engineer Providence R I | J A Parker Scranton S Dak | B P Fagan 1 Sharp Tenn |
| Miss E A G Apple Charlesville Pa | C F Heavener Ottsville Pa | South Carolina. | E S Carter 12345 Sioux Falls S Dak | A S Curry Trenton Tenn |
| Wm Loveland Corry Pa | J D Brennan Pleasant Mount Pa | Dr W H Geddings 456 Aiken S C | J H Warren Spearfish S Dak | W E Watkins Watkins Tenn |
| W T Gordon Coatesville Pa | Chas Moore Pottstown Pa | W G Peterson (Belmont) Newberry S C | Prof A W Thurston Vermillion S Dak | Dr C Buchanan Waynesborough Tenn |
| A L Runyon Cannonsburgh Pa | G H Dunkle Philipsburgh Pa | W R Godfrey Cheraw S C | Arthur Betts Webster S Dak | C W Graves Woodstock Tenn |
| H D Miller 56 Drifton Pa | Post Surgeon Allegheny Arsenal Pittsburgh Pa | Hon A P Butler Columbia S C | L O Libby Woonsocket S Dak | Texas. |
| Theo Day Dyberry Pa | J E Rooney Petersburgh Pa | Pvt J W Cronk Columbia S C | G W Frink Wolsey S Dak | Oscar Samostz Austin Tex |
| T H Walton Doylestown Pa | W R Wallace Drexel Building Philadelphia Pa | M P Daggett Conway S C | Tennessee. | Dr Q C Smith Austin Tex |
| C F Sweet Edinborough Pa | Post Surgeon Frankford Arsenal Philadelphia Pa | J W Earl (Evergreen) 14 Holland's Store S C | A T B Etheridge Arlington Tenn | J G Sloan 1 Brenham Tex |
| T B Lloyd Emporium Pa | Sgt T F Townsend Philadelphia Pa | P H Walsh Florence S C | J K P Wallace Andersonville Tenn | W H Potter (Bear Creek) Brady Tex |
| E S Chase Eagle's Mere Pa | Franklin Institute Philadelphia Pa | Sarah A Crittendon Greenville S C | Rev C F Williams Ashwood Tenn | H Stevens Brazoria Tex |
| Dr J W Moore Easton Pa | R C Stover 1 Point Pleasant Pa | W J Evans Hardeeville S C | P B Calhoun Austin Tenn | J F Mayo Brownwood Tex |
| Jos Bell Franklin Pa | J L Heacock Quakertown Pa | C B Webb Jacksonborough S C | F S Luther Hospital for Insane Bolivar Tenn | F R Blount 2 Colorado Tex |
| G W Wood Frederick Pa | C M Dechant 56 Reading Pa | Colin Macrae (Kirkwood) Camden S C | J I Hall Covington Tenn | W M Spitler 1234 Burnett Tex |
| J C Hilsman (Forks of Neshaminy) Rush Valley Pa | Rev W W Deatrich 6 Rimersburgh Pa | McCully & Fretwell 1234 McCormick S C | A A Arthur Cumberland Gap Tenn | J S Rogers Columbia Tex |
| Prof S H Miller 5 Greenville Pa | Geo Lowder (Smith's Corners) Point Pleasant Pa | H D Elliott Port Royal S C | Prof J A Lyons Clarksville Tenn | Prof Duncan Adriance College Station Tex |
| E C Wagner Girardville Pa | W M Schrock Somerset Pa | Miss N L Dawson 1 Simpsonville S C | Dr A Slack Cog Hill Tenn | W H Hamilton Box 169 Corsicana Tex |
| N Moore Grampian Hills Pa | J M Boyer 3 Selin's Grove Pa | J F Bayerly Spartanburg S C | F Hughes 12 Dyersburgh Tenn | E L Gibson 1 Corsicana Tex |
| Prof E S Breidenbaugh 3 Gettysburgh Pa | Prof Susan J Cunningham 6 Swarthmore Pa | J T Gray Spartanburg S C | L Boynton 45 Dunlap Tenn | G H Chipman Childress Tex |
| T Meehan 3 Germantown Pa | Prof Wm Frear State College Pa | Dr W W Anderson Statesburgh S C | J F Pickett Dyersburgh Tenn | C F Mercer Dallas Tex |
| Prof F P Leavenworth Haverford College Pa | B M Hall South Eaton Pa | E Gillard Trial S C | C F Vanderford Florence Station Tenn | F R Gillette 5 Dallas Tex |
| T B Orchard (Salem Cor) Hamlinton Pa | J A Roth Seisholtzville Pa | J Pagan Winnsborough S C | J C Diemer Fayetteville Tenn | H D Donald 56 Decatur, Tex |
| Prof W J Swigart Huntingdon Pa | Rev M Gustin Troy Pa | H G Reid Walhalla S C | W H Brown Greeneville Tenn | Anthony Blum 2345 Durham Tex |
| Prof J A Stewart Hollidaysburgh Pa | Miss Cora J Wilson Tipton Pa | J R Schorb Yorkville S C | J B Irwin Grand Junction Tenn | J C Edgar Duval Tex |
| John Torrey Honesdale Pa | Wm Hunt Uniontown Pa | South Dakota. | Miss Bell Baker Grief Tenn | H Graves Epworth Tex |
| S C Schumacker 156 Indiana Pa | A W Batterly Wilkes Barre Pa | W P Butler 12 Aberdeen S Dak | R Downey Hohenwald Tenn | J N Morris Forestburgh Tex |
| E C Lorentz Johnstown Pa | Dr J C Green West Chester Pa | W S Hill Alexandria S Dak | W C Hall Jacksboro Tenn | A Striegler Fredericksburgh Tex |
| B P Kirk Kennett Square Pa | H D Deming Wellsborough Pa | Prof Louis McLouth Brookings S Dak | H M Young 6 Kingston Tenn | Jas G Mallette 456 Ft Worth Tex |
| R J Mickey Kelmer Pa | Chas Beecher 5 Wysox Pa | Wm M Cappett Canton S Dak | W J Inman 6 Kingston Springs Tenn | Post Surgeon Ft Bliss El Paso Tex |
| J C Wucher Lynnport Pa | Prof W F Wickersham Westtown Pa | W H Boals Clark S Dak | J H Burrow Lynnville Tenn | Post Surgeon Ft Brown Brownsville Tex |
| F O Whitman Lewisburgh Pa | | Thomas H Ruth De Smet S Dak | A B Ewing Lewisburgh Tenn | Post Surgeon Ft Clark Brackettville Tex |
| H L Shull Lansdale Pa | | F J Cross (Cross) 12 Etta Mine S Dak | Prof J A Laughlin Lawrenceburgh Tenn | Post Surgeon Fort Davis Tex |
| | | Post Surgeon Fort Bennett S Dak | | Post Surgeon 1 Del Rio Tex |

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|--|---|--|--|--|
| Post Surgeon Ft Eagle Pass Tex | C M Tilford (Silver Falls) 4 Mt Blanco Tex | C R Moore Birdsneat Va | West Virginia. Henry Resseger Ella W Va | Post Surgeon Fort Bridger Wyo |
| Post Surgeon Ft Elliott via Miami Tex | W B Cormack 6 Tyler Tex | H D Walters Christiansburgh Va | L F Miars (Mt Alto) 123 Hartmonsville W Va | Post Surgeon Fort Russell Wyo |
| Post Surgeon Ft Hancock Tex | W H Godber Waco Tex | D A Heatwole Dale Enterprise Va | J E Murdock Kingwood W Va | Post Surgeon Fort McKinney Wyo |
| Post Surgeon Ft McIntosh Laredo Tex | Utah. | D K Witte Fall Creek Depot Va | A W Cook Oceana W Va | Post Surgeon Camp Pilot Butte Rock Springs Wyo |
| Post Surgeon Camp Pena Colorado Marathon Tex | H C Wallace 6 Alta Utah | Post Surgeon Fort Monroe Va | D Titchenell Pleasant Hill W Va | Post Surgeon Fort Sheridan |
| Post Surgeon Ft Ringgold 26 Rio Grande City Tex | Miss Hattie E Farnsworth Beaver Utah | Post Surgeon Fort Myer Va | F M Swann Tyler's Creek W Va | Mammoth Hot Springs Wyo |
| Post Surgeon San Antonio Tex | Post Surgeon Fort Du Chesne Utah | Prof H D Campbell Lexington Va | G H Trembly Tannery W Va | Post Surgeon Fort Washakie Wyo |
| Lum Woodruff Gallinas Tex | B F Cooke 12345 Grouse Creek Utah | W N Stone Liberty Va | Wisconsin. | Foreign. |
| D F Ragsdale 6 Gainesville Tex | A B Larson Levan Utah | A T Lincoln Marion Va | H Besse jr Butternut Wis | Prof J Bolam Govt Naviga School 14 Dock Place Leith Scotland |
| D D Bryan Galveston Tex | E Caffall Losee Utah | R V Gaines Mossing Ford Va | B C Curtis Cadiz Wis | Dr C F Hering Burnside (Coronie) Colony of Surinam Dutch Guiana S A |
| Sgt I M Cline Galveston Tex | R Moncur Mt Carmel Utah | G Dunn Nottoway Va | Geo L Collie 6 Delavan Wis | G J Gibbs Grand Turk Turks Islands Brit W I |
| A B Gant Graham Tex | H C Davidson Mt Pleasant Utah | Prof J M Colson Jr Petersburgh Va | J E Breed Embarrass Wis | Director Meteorological Obs'y 56 Guanajuato Mexico |
| W J Crowley 12345 Grapevine Tex | H J Crouse 6 Moab Utah | W H Pleasants Richmond Va | J C Wedge 123 Fond du Lac Wis | Gen Russell Hastings Hamilton Bermuda |
| P D Sanders 123 Haskell Tex | W W Crossman Ogden Utah | J R Purdie Smithfield Va | H M Crombie 6 Glasgow Wis | Dr Enrique del Monte Astro and Met'l Obs'y Park Vedado |
| D R Sanders Houston Tex | W R May Nephi Utah | B W Jones 56 Spottsville Va | Dr M L Robey 4 Grantsburgh Wis | 456 Havana Cuba |
| W A Snell Hearne Tex | N Anderson Richfield Utah | S C Wells Salem Va | H J Thomas Greenwood Wis | Prof M Leal Leon Guanajuato Mexico |
| C F Conklin 5 Hartley Tex | Seth A Pymm 45 St George Utah | W C Hedrick 2 Staunton Va | Henry Beal 456 Hayward Wis | Director Astro and Met'l Obs'y Mazatlan Mexico |
| W T Barr Huntsville Tex | Post Surgeon Fort Douglas Salt Lake City Utah | J R Sim Summit Va | J A McIntosh Honey Creek Wis | Director Cen Met Obs'y City of Mexico Mexico |
| W M Smith Howe Tex | J Robbins 123 Snowville Utah | H G Wadley 1234 Wytheville Va | A J Looze Lincoln Wis | Prof C H McLeod McGill College Obs'y 46 Montreal Canada |
| D B McMillan (Caddo Peak) | Vermont. | Washington. | Washburn Observatory Madison Wis | Capt Adolphus Peele New Westminster 124 British Columbia |
| 6 Joshua Tex | W H Childs Brattleboro Vt | R M Hoskinson Blakeley Wash | Miss Johanna Lups Manitowoc Wis | Prof P Scherer Meteorological Obs'y Port au Prince Hayti |
| Jos Cottam La Grange Tex | H B Chamberlain Brattleboro Vt | W H Mossman 123 Chehalis Wash | Wm Heaslett Neillsville Wis | Director Catholic Institute 456 Pueblo Mexico |
| Dr C M Ramsdell 1 Lampasas Tex | W B Gates 55 Elwood Avenue Burlington Vt | R C Willis Doe Bay Wash | Prof G M Browne Oshkosh Wis | Director Institute de Ciencias del Estado de 6 Zacatecas Mexico |
| G W Krech Longview Tex | H L Bixby Chelsea Vt | S R S Gay 12345 East Sound Wash | E M Corey 1234 Potosi Wis | J Byrns La Logia Sinaloa Mexico |
| J E Fisher 123 Luling Tex | C H Lane Cornwall Vt | D Pullen 1234 Lapush Wash | E S Koepenick Summit Lake Wis | John Bell Topolobampo 156 Sinaloa Mexico |
| S G Lackey Mesquite Tex | H B Lovering East Berkshire Vt | Henry Teal 1234 North Yakima Wash | G H Yapp Waucousta Wis | J Higgins Saint Johns 6 Newfoundland |
| J L Vaughan Merkel Tex | Rev A Hazen Hartland Vt | R W Starr Waterville Wash | C Rice 6 Wauzeka Wis | Curtis J Lyons Honolulu |
| Louis Runge Menardville Tex | J W Hatch Jacksonville Vt | Post Surgeon Fort Canby Wash care Astoria Oregon | W H Anderson 123 Weston Wis | 3 Hawaiian Islands |
| Dr J C Riley 12 Mountain Spring Tex | Dr H A Cutting Lunenburg Vt | A Wilgus 123 Fort Simcoe Wash | Wyoming. | |
| Paul Wipprecht 6 New Braunfels Tex | H F J Scribner Strafford Vt | Post Surgeon Fort Spokane Miles Wash | Wm Werner Fort Fetterman Wyo | |
| C Runge New Ulm Tex | A Whitehead Vernon Vt | Post Surgeon Fort Townsend Port Townsend Wash | F T Wright 56 Lander Wyo | |
| A L Rush 1 Ochiltree Tex | B H Albee Weathersfield Vt | Post Surgeon Vancouver Barracks Wash | F S Lusk 456 Lusk Wyo | |
| J L Gray Panhandle Tex | Virginia. | Post Surgeon Fort Walla Walla Wash | J F Crawford Saratoga Wyo | |
| E H Snider Panter Tex | Ashby Miller 12 Alexandria Va | | Chas S Price 3456 Sundance Wyo | |
| K D Blankenship 12 Pike Tex | G F Eakle Bolar Va | | M R Johnston Wheatland Wyo | |
| W Weiss 1 Round Rock Tex | | | | |

List of merchant marine steam and sailing vessels from which International Meteorological reports were received at the office of the Chief Signal Officer, U. S. Army, Washington City, in time to be used in the preparation of the Monthly Weather Review for June, 1890.

| Name of vessel. | Captain. | Name of vessel. | Captain. | Name of vessel. | Captain. |
|---------------------------|-----------------------|--------------------------|--------------------|--------------------------------|------------------|
| Am. s. s. Adirondack..... | J. W. Sansom. | Am. s. s. Excelsior..... | H. L. Higgins. | Br. s. s. Palestine..... | W. Whiteway. |
| Br. Advance..... | D. E. Griffiths. | Fanita..... | F. Pennington. | Parisian..... | J. Ritchie. |
| Adventure..... | Thomas Dixon. | Federation..... | R. Pinkham. | Am. Pascal..... | J. W. Trenaman. |
| Aguan..... | J. Adair. | Fedrico..... | A. Foruria. | Br. Pavonia..... | A. McKay. |
| Ailsa..... | J. W. Morris. | Fonar..... | A. Cunningham. | Dtch. P. Caland..... | G. Lutz. |
| Alaska..... | G. S. Murray. | France..... | A. D. Hadley. | Br. Peconic..... | W. Harnden. |
| Alene..... | E. J. Seiders. | Frankfurt..... | C. Stencken. | Belg. Pennland..... | H. Buschmann. |
| Alexandria..... | F. W. Mason. | Friesland..... | W. G. Randle. | Am. Pennsylvania..... | E. B. Thomas. |
| Alexander Elder..... | R. Boutcher. | Fulda..... | R. Ringk. | Aust. Petriana..... | F. Stanwell. |
| Alfred Dumois..... | L. Christie. | Furnessia..... | J. Norris. | Br. Picton..... | P. Brown. |
| Alger..... | H. Christoffers. | Galileo..... | W. Magee. | Ger. Piqua..... | J. T. Lund. |
| Alpha..... | S. O. Crowell. | Gallego..... | Arribalsa. | Polaria..... | F. Schroeder. |
| Alvena..... | F. McKay. | Gallia..... | M. Murphy. | Polynesia..... | G. Franck. |
| Alvo..... | David Williams. | Gellert..... | C. Kaempff. | Portia..... | F. Ash. |
| Ambrase..... | H. P. Smith. | Germanic..... | J. G. Cameron. | Prins, Wm. II..... | J. T. Dorr. |
| América..... | A. Kohlmann. | Gladiolus..... | G. Wright. | Prior..... | G. Graham. |
| Amsterdam..... | G. Stenger. | Gloucester City..... | R. Jones. | Prussian..... | J. Ambury. |
| Anchoria..... | A. Campbell. | Gothenburg City..... | J. Harrison. | Prydian..... | M. Parry. |
| Andean..... | A. H. Highton. | Grecian..... | C. E. Le Gallais. | Queensmoore..... | J. Treney. |
| Apollo..... | W. S. Morgan. | Greece..... | A. J. Jeffrey. | Rhaetia..... | W. Kuhlwein. |
| Assyrian..... | J. Bentley. | Hafia..... | D. Gerdam. | Rhein..... | W. Kuhlmann. |
| Arizona..... | S. Brooks. | Hans & Kurt..... | Carl Hoelck. | Rhosina..... | T. Pearn. |
| Athos..... | H. Low. | Haytian..... | J. Coward. | Rhyndland..... | R. Weyer. |
| Attila..... | A. Barclay. | Helvetia..... | H. G. Cochrane. | Rialto..... | R. Akester. |
| Aurania..... | Thos Dutton. | Hermann..... | Bodeker. | Richmond..... | E. S. Clapp. |
| Baltimore..... | C. W. Simpson. | Hindoo..... | Jas. Douglas. | Richmond Hill..... | R. P. Bennett. |
| Barrowmore..... | W. H. Moore. | Holland..... | Thos. Foote. | Rochdale..... | F. D. Tindall. |
| Bavarian..... | M. Fitt. | Hipparchus..... | A. Cadojan. | Roman..... | E. Maddox. |
| Bayonne..... | J. E. Payne. | Iago..... | F. W. Ouston. | Rotterdam..... | H. C. v. d. Zee. |
| Bede..... | W. Anderson. | Imbros..... | E. V. Pashly. | Rowena..... | J. Limond. |
| Belgeland..... | E. Bence. | Iowa..... | E. W. Owens. | Rugia..... | R. Karlowa. |
| Bellena..... | J. McMillan. | Island..... | W. Skjodd. | Runic..... | T. P. Thompson. |
| Bohemia..... | H. Leithausen. | Italia..... | G. Schmidt. | Russia..... | G. Schmidt. |
| Blue Jacket..... | J. A. Paull. | Italy..... | W. Pearce. | Russian Prince..... | J. Newton. |
| Bothnia..... | B. Watt. | James Turpie..... | W. Smith. | Saale..... | H. Richter. |
| Boston City..... | H. W. Pell. | Karoon..... | W. Wandless. | Saginaw..... | R. B. Kelly. |
| Bremerhaven..... | C. Schmidt. | Kansas..... | A. Fenton. | Saint Marnock..... | J. H. C. Boig. |
| Britannia..... | Parazols. | Karlsruhe..... | F. Kessler. | Saint Ronans..... | H. Campbell. |
| Britannic..... | H. Davidson. | Kepler..... | P. H. Tanner. | Samaria..... | T. Hewitson. |
| British Empire..... | R. Willis. | King's Cross..... | C. J. Mills. | Saratoga..... | C. P. Leighton. |
| British Prince..... | S. Nowell. | La Bourgogne..... | E. Franguel. | Sardinian..... | W. Richardson. |
| British Princess..... | E. H. Freeth. | La Bretagne..... | M. de Jouselin. | Sarnia..... | J. Gibson. |
| Brooklyn City..... | W. Fitt. | La Campine..... | E. Smit. | Scandia..... | E. Kopff. |
| Brunell..... | J. W. Henderson. | La Champagne..... | Boyer. | Scandinavian..... | J. France. |
| Buffalo..... | J. H. Malet. | La Flandre..... | M. W. Nines. | Scythia..... | T. Roberts. |
| Burgum'ter Petersen..... | A. Reeckmann. | La Gascogne..... | Santelli. | Seneca..... | F. Stevens. |
| Bulgarian..... | R. Leask. | Lahn..... | H. Hellmers. | Serra..... | F. de Luzarrago. |
| California..... | R. T. Garvie. | Lake Huron..... | P. D. Murray. | Servia..... | H. Walker. |
| Californian..... | J. W. Pickthall. | Lake Nepigon..... | C. F. Herriman. | Siberian..... | J. Park. |
| Camden..... | W. N. James. | Lake Ontario..... | H. Campbell. | Sir Wm. Armstrong..... | J. McKenzie. |
| Camellia..... | E. Penney. | Lake Superior..... | Wm. Stewart. | Sirius..... | T. P. Fisher. |
| Canada..... | J. Robinson. | Lake Winnepeg..... | F. Carey. | Spaarndam..... | F. H. Bonjer. |
| Caspian..... | R. P. Moore. | Lancashire..... | G. H. Harris. | Spain..... | W. A. Griffiths. |
| Cassius..... | C. Rix. | La Normandie..... | G. Collier. | Stanmore..... | A. W. Wade. |
| Catalonia..... | J. J. Atkin. | Laplace..... | F. R. Salter. | State of Indiana..... | A. Ritchie. |
| Catania..... | H. M. Franck. | Leona..... | J. Bolger. | State of Nebraska..... | A. G. Braes. |
| Cephalonia..... | W. S. Seccombe. | Lapanto..... | H. S. S. Wise. | State of Nevada..... | J. Henderson. |
| Cervin..... | S. Hughson. | Lero..... | J. Chisolm. | State of Pennsylvania..... | A. J. A. Mann. |
| Chateau Lafite..... | M. C. Ollivier. | Llandaff City..... | T. H. Gore. | State of Texas..... | G. Williams. |
| Charles Morand..... | W. H. Marshall. | Lord Clive..... | P. Urquhart. | Stella..... | H. Gohde. |
| Chelydra..... | C. Chater. | Lord Gough..... | E. M. Hughes. | Stockholm City..... | W. Thompson. |
| Cherokee..... | H. A. Bearse. | Louisiana..... | E. V. Gager. | Strathairly..... | W. Winn. |
| Circassia..... | J. Hedderwick. | Ludgate Hill..... | J. Brown. | Stura..... | C. Cadfero. |
| Circassian..... | A. McDougall. | Lydian Monarch..... | T. C. Huggett. | Swavia..... | C. Ludwig. |
| Circe..... | R. C. Jennings. | Masdam..... | A. Potjer. | Switzerland..... | J. Ueberweg. |
| City of Berlin..... | F. S. Land. | Main..... | M. Moller. | Taormina..... | G. W. Loch. |
| City of Chester..... | E. F. Barff. | Maine..... | H. Bocquet. | Teutonia..... | C. Schuck. |
| City of Chicago..... | A. Redford. | Majestic..... | H. Parsell. | The Queen..... | P. J. Irving. |
| City of New York..... | A. W. Lewis. | Manitoban..... | J. M. Johnston. | Thomas Turnbull..... | W. Sample. |
| City of Para..... | J. L. Lockwood. | Marengo..... | W. Whitton. | Timor..... | W. Hodgson. |
| City of Savannah..... | C. B. Gogins. | Marsala..... | N. Maass. | Titanic..... | C. G. Shaw. |
| City of Washington..... | C. W. Reynolds. | Martello..... | W. Abbott. | Tomas Brooks..... | E. F. Canal. |
| Colonia..... | A. Worpel. | Mascotte..... | Jas. Ross. | Toronto..... | J. MacAuley. |
| Colorado..... | F. E. Jenkins. | Mentmore..... | R. Waite. | Tower Hill..... | R. Bennett. |
| Columbia..... | H. Vogelgesang. | Merchant Prince..... | S. P. Hoskin. | Tordenskjold..... | C. Uchermann. |
| Cosmopolitan..... | F. Corner. | Michigan..... | S. Walters. | Trave..... | R. Bussius. |
| Crane..... | G. J. Robinson. | Minicola..... | T. S. Evans. | Treglissou..... | J. Blackie. |
| Cremont..... | C. W. Reche. | Minia..... | S. Trott. | Trinacria..... | G. Mitchell. |
| Cromon..... | W. E. Lord. | Minister Maybach..... | B. Schierhorst. | Trinidad..... | W. J. Fraser. |
| Cuba..... | J. A. Bornholdt. | Minnesota..... | R. Griffiths. | Ulunda..... | T. Clark. |
| Cuban..... | W. Ansom. | Missouri..... | H. Murrell. | Umbria..... | H. McKay. |
| Cufic..... | R. Nicol. | Montana..... | S. Layland. | Urbino..... | Evans. |
| Cyprus..... | E. Guild. | Moravia..... | O. Winkler. | Vancouver..... | C. J. Lindall. |
| Danaria..... | G. Dixon. | Mount Edgecomb..... | J. Wetherell. | Vandyck..... | T. Phelan. |
| Dania..... | E. Schultz. | Munchen..... | A. Jaeger. | Venetian..... | E. Parry. |
| Denmark..... | B. S. Rigby. | Muriel..... | G. S. Locke. | Viking..... | F. Haslund. |
| Devonia..... | Jno. Craig. | Naranja..... | J. Silly. | Ville de Douai..... | Dependant. |
| Earnwell..... | C. N. Mumford. | Navarro..... | S. de Felleria. | Virginian..... | W. C. Fry. |
| Edenmore..... | A. A. Watson. | Nederland..... | A. R. Mills. | Waesland..... | C. H. Grant. |
| Edwin..... | W. T. Stacey. | Nesmore..... | T. E. Williams. | Washington..... | D. Zanelli. |
| Egypt..... | J. Sumner. | Nestorian..... | Isaac Goodwin. | Werkendam..... | W. Bakker. |
| Egyptian Monarch..... | J. Sumner. | Nevada..... | J. A. R. Cushing. | Werra..... | C. Pohle. |
| Elder..... | H. Baur. | Newport..... | G. W. Shackford. | Weser..... | H. Winter. |
| Elbe..... | C. Thalenhorst. | Nicosian..... | J. Jones. | Westernland..... | J. C. Jamison. |
| El Dorado..... | H. J. Byrne. | Noordland..... | H. E. Nickels. | Wieland..... | H. Barends. |
| Electrique..... | P. Charles. | Normannia..... | C. Hebach. | William Cliff..... | C. Winder. |
| Elfrida..... | W. Rasmussen. | Norseman..... | R. Williams. | Wisconsin..... | J. P. Worrel. |
| Elgiva..... | H. Bernpohl. | North Gwallia..... | O. Owens. | Wydale..... | J. H. Gibson. |
| El Monte..... | R. B. Quick. | Obdam..... | G. Bakker. | Wyoming..... | C. L. Rigby. |
| El Paso..... | H. S. Quick. | Ocean..... | A. Voqe. | Yoxford..... | T. H. Smith. |
| Elvaston..... | W. E. Steele. | Oceanic..... | W. W. Smith. | | |
| Ems..... | R. Sander. | Oevelgonne..... | P. Quast. | | |
| England..... | A. F. Healey. | Ohio..... | R. W. Sargent. | United States Naval..... | J. G. Green. |
| Enrique..... | D. J. A. de Larrauri. | Ohio..... | P. L. Moore. | U. S. S. Adams..... | J. F. Moser. |
| Espana..... | R. Nilsen. | Ontario..... | W. P. Couch. | U. S. S. A. D. Bache..... | W. S. Cowles. |
| Ethiopia..... | John Wilson. | Oregon..... | H. C. Williams. | U. S. S. Despatch..... | Yates Stirling. |
| Ethelbald..... | R. Robertson. | Orinoco..... | J. S. Garvin. | U. S. S. Dolphin..... | W. P. Elliott. |
| Etruria..... | W. H. P. Hains. | Orizaba..... | J. McIntosh. | U. S. S. schr. Eagre..... | J. N. Jordan. |
| Euskaro..... | M. Zabalandicoehen. | Orkla..... | J. T. Southerland. | U. S. C. S. schr. Earnest..... | R. Platt. |
| Exeter City..... | T. L. Weiss. | Osmanli..... | C. O'Hagan. | U. S. C. S. G. S. Blake..... | C. E. Vreeland. |

List of merchant marine steam and sailing vessels from which International Meteorological reports were received at the office of the Chief Signal Officer, U. S. Army, Washington City, in time to be used in the preparation of the Monthly Weather Review for June, 1890—Continued.

| Name of vessel. | Captain. | Name of vessel. | Captain. | Name of vessel. | Captain. |
|---------------------------------------|------------------|--------------------------------|-----------------|--------------------------------|--------------------|
| <i>United States Naval—Continued.</i> | | | | | |
| U. S. C. S. Gedney..... | J. M. Helm. | Am. schr. Benj. C. Frith | J. T. Fales. | Am. schr. John R. Bergen | W. H. Squires. |
| U. S. S. Independence | Byron Wilson. | bkt. Bonnie Doon | Chas. Burgess.* | bkt. John R. Stanhope | J. B. Norton. |
| U. S. S. Iroquois | J. Bishop. | Br. bkt. Brazil | H. Davison. | Port. Julius | F. D. Vieira. |
| U. S. S. Kearsarge | H. Elmer. | sp. British Sceptre..... | R. W. Neville. | Am. schr. Kate Church | J. H. Weeks. |
| U. S. C. & G. McArthur | D. H. Mahan. | Am. bkt. Chestina Redman | E. A. Watts. | bkt. Kennard | J. A. Bettencourt. |
| U. S. S. Minnesota | G. C. Wiltse. | schr. Clara Godwin..... | Frank Wyman. | Br. Lady Nairn | Thos. Richards. |
| U. S. S. Monongahela | W. C. Gibson. | It. bkt. Clementina..... | G. Porzio. | Ger. Leocadia | T. Stohff. |
| U. S. S. New Hampshire | F. J. Higginson. | Am. schr. D. W. McLean..... | G. W. Thomas. | sp. Light vessel No. 45.... | Andrew Jackson. |
| U. S. S. Ranger | G. C. Reiter. | bkt. Edward May | D. Mahany. | Br. bkt. Minden | R. MacDonald. |
| U. S. S. Richmond | L. Kingsley. | schr. Ettie H. Lister | S. D. Mason. | schr. Molega | James Lohnes. |
| U. S. S. Pensacola..... | A. R. Yates. | Br. bkt. Eulie | J. Collier. | Phebe | M. Medero. |
| U. S. S. Thetis | C. H. Stockton. | Am. schr. Gertrude | W. H. Cox. | Nor. bkt. Prince Eugene | C. F. Nygaard. |
| U. S. S. Yorktown | F. E. Chadwick. | bkt. Glad Tidings | R. Roberts. | Am. schr. Roger Drury | John Delay. |
| <i>Sailing vessels.</i> | | bg. H. B. Hussey..... | G. W. Hodgdon. | Ger. bk. Soli-Deo-Gloria..... | A. R. Mehaffy. |
| Nor. bkt. Agatha | C. F. C. Rohr. | Dtch. bk. Helena | J. J. Veerbeet. | Am. bg. Stacy Clark | F. Abendroth. |
| Am. Alice | W. G. Kair. | Am. schr. Henry A. Faber | H. E. Garlick. | sp. Tillie E. Starbuck..... | E. Curtis. |
| It. Anna Maria D'Abundo. | C. Monti. | Nor. bk. Hovding..... | C. Reynolds. | Br. bgt. Ubaldina | H. F. Schivo. |
| Br. Annie Burrill | C. A. Trefry. | Ger. India | T. Regener. | bkt. Valona | H. Andrews. |
| Am. bg. Arcot | J. W. Cates. | Am. Itonus | Buckman. | Zimi..... | D. Lloyd. |
| schr. Belle of the Bay | J. W. Emmons. | John D. Brewer | W. L. Josselyn. | | |
| | | bkt. John J. Marsh | F. P. Whittier. | | |